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EDISON ELECTRIC INSTITUTE BULLETIN

SEPTEMBER, 1939

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EDISON ELECTRIC INSTITUTE

THE ELECTRIC LIGHT AND POWER INDUSTRY

Current Statistical Data Covering 100 Per Cent of Industry

DURING THE MONTH OF JUNE

	1939	1938	%
	SOURCE OF ENERGY		
Kilowatthours Generated (Net)			
By Fuel Burning Plants	6,510,603,000	5,293,700,000	+23.1
By Water Power	3,420,987,000	3,434,974,000	− 0.4
Total Generation	9,931,590,000	8,728,674,000	+13.8
Net Purchases			
From "Other Sources"	296,472,000	298,784,000	− 0.8
Net International Imports	113,499,000	92,537,000	+22.7
Total Purchased Power	409,971,000	391,321,000	+ 4.8
Total Input	**10,341,561,000**	**9,119,995,000**	**+13.4**
	DISPOSAL OF ENERGY		
Total Sales to Ultimate Customers	**8,577,121,000**	**7,436,930,000**	**+15.3**
Company Use, Etc.			
Used in Electric Railway Department	33,724,000	30,479,000	+10.6
Used in Electric and Other Departments	147,972,000	147,217,000	+ 0.5
Furnished Free or Exchanged in Kind	4,551,000	8,213,000	−
Total Company Use, Etc.	186,247,000	185,909,000	+ 0.2
Total Energy Accounted For	**8,763,368,000**	**7,622,839,000**	**+15.0**
Losses and Unaccounted For	1,578,193,000	1,497,156,000	+ 5.4
Total Output (To Check Above **"Input"**)	**10,341,561,000**	**9,119,995,000**	**+13.4**
	CLASSIFICATION OF KILOWATTHOUR SALES		
Residential or Domestic	1,626,739,000	1,486,800,000	+ 9.4
Rural (Distinct Rural Rates Only)	(Allocated to	Other Classes)	−
Commercial and Industrial			
Small Light and Power (Retail)	1,635,266,000	1,457,623,000	+12.2
Large Light and Power (Wholesale)	4,533,615,000	3,726,679,000	+21.7
Public Street and Highway Lighting	111,031,000	107,000,000	+ 3.8
Other Public Authorities	194,368,000	211,380,000	− 8.0
Street and Interurban Railways	296,667,000	303,303,000	− 2.2
Electrified Steam Railroads	144,248,000	110,440,000	+30.6
Interdepartmental	35,187,000	33,705,000	+ 4.4
Sales to Ultimate Customers	**8,577,121,000**	**7,436,930,000**	**+15.3**
	ESTIMATED REVENUE		
Revenue from Ultimate Customers	$184,231,200	$172,319,600	+ 6.9
Other Electric Revenue	1,934,800	1,951,400	− 0.9
Total Revenue	$186,166,000	$174,271,000	+ 6.8
	RESIDENTIAL OR DOMESTIC ELECTRIC SERVICE— 12 MONTHS. ENDED—JUNE 30th		
Kilowatthours per Customer	878	829	+ 5.9
Average Annual Bill	$36.44	$35.73	+ 2.0
Revenue per Kilowatthour	4.15¢	4.31¢	− 3.7

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EDISON ELECTRIC INSTITUTE BULLETIN

Volume 7 SEPTEMBER, 1939 No. 9

Developments of the Bare Neutral Proposal

By Alexander Maxwell
Director of Engineering, E.E.I.

OF the several proposals made for revisions of the National Electrical Code the proposal for "bare neutrals" has apparently brought about more misunderstanding than any other. Although this proposal is really a very simple one the confusion may be understandable, in part, for the reason that the technical basis for it is somewhat novel and perhaps a little more difficult technically, than most of the questions that come up for Code discussion. In some cases, however, misunderstandings have arisen concerning the intentions of the proposers which must have been based on conjecture alone and which are in fact quite contrary to the views of those advocating the use of bare neutrals.

Foremost among such groundless conjectures is the assertion, more or less current, that the elimination of the insulation from neutral conductors was merely a step in the direction of eliminating neutral conductors altogether. Needless to say such a development has not been and is not being even considered. But more than this, there are many technical and economic reasons why the neutral conductor must be employed wherever loads are connected between energized wires and the neutral point of an interior wiring system.

Considerations of voltage drop alone in the case of two-wire circuits, and of balance and regulation as well in the case of multi-wire circuits are sufficient to preclude the use of any other than normal wire circuits of known and permanent impedance for such neutral conductors. It is true that the neutral conductor in multi-wire balanced circuits does not normally carry current but there are probably very few such circuits that are precisely balanced for much of the time, and under conditions of unbalance when the neutral conductor is wanted to fulfill its intended function, it is wanted quite badly, if anything like acceptable voltage balance is to be maintained.

Possibly this idea originated in the single installation known to the writer where the electrical conduit was used as the return conductor. There is one such building—and only one so far as our records show, where this system is installed; it is the Mechanical Engineering Building at the University of Wisconsin. The installation was described in a brochure prepared by Professor Edward Bennett and the system was applied to the smallest sizes of conduit, and to final circuits only. So far as is known, the experiment was entirely successful but it has not been copied. Probably the most serious disadvantage in the use of a conduit return system would be the increased impedance as shown in the table below:

Conduit Size	Neutral Size	Current	Measured Circuit Impedance (About 100 Ft.) Insulated Neutral	Bare Neutral	One Wire Conduit Return
½"	14	15	.51	.32	.41
¾"	10	25	.24	.20	.31
1"	10	25	.24	.18	.26
1"	5	50	.09	.08	.15

A second serious deterrent to the use of such a system is the very marked noise, due to mechanical vibration, which will occur wherever conduit is at all free to vibrate. In our laboratory tests the conduits, when equipped with fully insulated neutrals or with bare neutrals, were quiet. But when the neutral was eliminated and the conduit was used as the return conductor a very marked audio-noise emanated from the assembly. Such noise would unquestionably prove objectionable in many locations.

There is no intention on the part of the Electric Light and Power Group to advocate the elimination of the neutral conductor in any system of interior wiring where load is connected between the line and neutral, as such a step would be a serious detriment to the integrity of the electrical system concerned.

It is also possible that opinions have been influenced to a considerable extent by earlier discussions of other types and other uses of bare neutral conductors that have quite different characteristics. The present proposal before the Code committee is for the use of bare neutral conductors in standard rigid conduit and electrical metallic tubing only, with certain other limitations concerning grounding, system voltage, etc. The published studies supporting this proposal have shown clearly that the amount of by-pass current is definitely limited to a very small amount and that there are definite technical reasons for this limitation.

The bare neutral assemblies which have been discussed in earlier years were of quite another type and had characteristics which caused a substantially large proportion of the neutral current to divide among available by-paths. Installations of this type were the principal subject investigated and reported upon in the report of the Underwriters Laboratories No. E11064 of Jan. 10, 1935. This investigation resulted in a favorable report although the installations studied

were for the greater part ones in which the by-pass current was often as much as half of the total neutral current. This was because the majority of the installations were of the Edison armored type having a steel tape armor or were of any one of several adaptations of conventional armored cable.

In view of the fact that these relatively large by-pass currents were reported and discussed for these earlier experiments it is perhaps understandable that many persons have formed the impression that by-pass currents of the same general magnitude will result from the present proposal for bare neutrals in conduit. However, the refutation of this idea is contained in the pamphlet "Discussion of Proposals" where it is shown by theory and by test that the magnitude of by-pass currents is controlled almost completely by the magnetic characteristics of the enclosing metal. It is further shown that conduit, being metallically continuous and enclosing all of the flux, is surprisingly efficient for the magnetic circuit, so that the practical disappearance of by-pass current is accounted for rationally.

Another criticism that has been made is that a dishonest workman might cheat by merely placing two or three feet of wire at the ends of the conduit. According to the stories told by electrical inspectors this practice has been known in the past in connection with fully insulated neutrals and there is, perhaps, some probability that it might be tried. It is for such possibilities that inspections are made. In the case of uninsulated neutrals the implication is made that because they are bare and therefore more or less in contact with the conduit this discontinuity of the neutral conductor may be less readily detected. This is actually not the case on account of the extremely small voltages available in the neutral which would cause such chance contacts to be easily revealed unless special care was taken to make a firm contact which would be about as costly as providing the proper conductor in the first place. In cases where the continuity of the conductors is tested through with instruments, such discontinuities would, of course, readily be revealed. On the whole, the foregoing feature appears merely to be a detail of inspection procedure and one wherein the bare neutral does not differ from the existing insulated neutral.

A third comment which has been encountered more or less frequently is that concerning the dire effects of a reversal of polarity. It is difficult to understand the reasoning which leads to this apprehension. For the bare neutral in this respect is not different from any other neutral conductor except that it is more firmly grounded. A reversal of polarity leads immediately to the clearing of the circuit by the operation of the fuses and this is the intended operation of the standard connection with grounded neutral. The only difference is that, in the case of a bare neutral, this action is more prompt and certain and is insured by the conduit ground as well as by the neutral ground.

It has been noted previously that the electrical conditions characteristic of bare neutral installations have existed for many years and in large numbers due to the practice of reversing live conductors and insulated neutrals as a means of clearing faulty live conductors instead of locating and repairing the fault. This practice is widespread and old and it has, in effect, nullified the Code provision that there shall be no neutral grounds on the interior installation beyond the service ground. Taking the industry as a whole, there has been rather a large amount of complacency and more than a little wishful thinking in this respect. There is no mystery about it, since the field conditions can be checked readily, but there appears to be a definite reluctance to admit that we have been living with the electrical conditions characteristic of bare neutral probably since the advent of metal enclosed wiring systems.

Perhaps there is a good deal to be said for the reversal of conductors as a rapid means for restoring service, but the Code contemplates a rather complete degree of polarization as an important safety feature. Carrying out the spirit of these polarization requirements should make it necessary, in the case of a faulted live conductor, that the fault shall be located and repaired. This would be the necessary procedure where bare neutrals were used.

There is another aspect of the bare neutral proposal that may enlist the interest of those who have followed the development of the scope and influence of the National Electrical Code, or of building and similar industrial codes generally. This is an apparent feeling that if bare neutrals were recognized in the Code there would exist some sort of a mandatory requirement to employ them, whether or not one wanted to do so. This also is very far from the thoughts or intentions of the proposers. The situation arises from divergent concepts of the function of the Code, or of any voluntary standard.

Primarily the National Electrical Code is a collection of rules to provide safety in its field against fire or personal hazards. To this end it requires that certain things shall be done, and certain other things shall not be done, to make an interior electrical wiring installation satisfactory in such respects. It does not purport to be a specification of a standard for design. Nevertheless the rules that the Code does contain are numerous and extensive enough to serve as a fairly good guide for the simpler kind of installations. There is no doubt that it is so used by large segments of the industry; there is no valid compulsion to use it in this manner, but it is readily available, it only costs a nickel or less, it has to be consulted anyway for the matters within its proper sphere, and so it serves. There are many other and less obvious reasons for this pre-eminence, but it is sufficient to note here that a very large proportion of the electrical industry, without much critical analysis of the precise scope of this Code, or of its language, does react as though if a thing is incorporated in the Code, that is the way all wiring shall be done.

It is not necessary to examine the opposite view in detail, but it should be pointed out that the proposers of a permissive rule for bare neutrals, a "may" rule, do not contemplate that it thereupon becomes mandatory that it shall be used in all installations without regard to its peculiar usefulness. On the other hand the proposers say that it should be used where it will be useful. It will be recalled that the reason for the bare neutral was space saving in order that the space saved might be filled with active copper. As this actually works out, and regardless of any other savings in the bulk of insulation, the use of a bare neutral permits the use of two or more larger sizes of copper. There are other combinations of conductors where the omission of neutral insulation would not make this difference, that is to say, where the space saved would still be only space because it is not quite enough to permit increased copper sizes. In the latter case there is no point in using a bare neutral, just for the fun of using it; it is in the former case, where real gains can be had, that it should be used.

Electric Output During the Last War

By William M. Carpenter
Economist, Edison Electric Institute

THE following table and charts attempt by approximation to carry back to pre-war days the same series of figures covering the monthly generation of electricity by public utilities that was begun in 1919 by the United States Geological Survey and carried forward up to the present day by the Federal Power Commission (see Notes).

These data afford a perspective of the growth of the use of electricity. A smooth curve drawn through the totals of the early years suggests that what happened was that industrial activity, stimulated by war orders, changed the curve of annual output from perhaps 1½ billion kwhr below normal in 1914 and 1915 to perhaps 2½ billion kwhr above normal in 1917 and 1918—a total change of some 4 billion per year as the *net* effect of the war for the country as a whole.

At the close of 1914, the U. S. Census of Manufactures showed that, of the total 22,290,899 horsepower of primary power in industry, 3,884,724 horsepower (or 17½ per cent) consisted of electric motors operated on power procured from public utilities. In 1915, this figure was about 20 per cent, and, if an increase in output of 4 billion kwhr per year because of the war was registered by 20 per cent of industry, it is logical to assume that the entire war requirements of the Nation—for itself and its Allies, in ships, shoes and shells and by all industry, electrically and mechanically driven—came to the equivalent of 20 billion kwhr per year.[1]

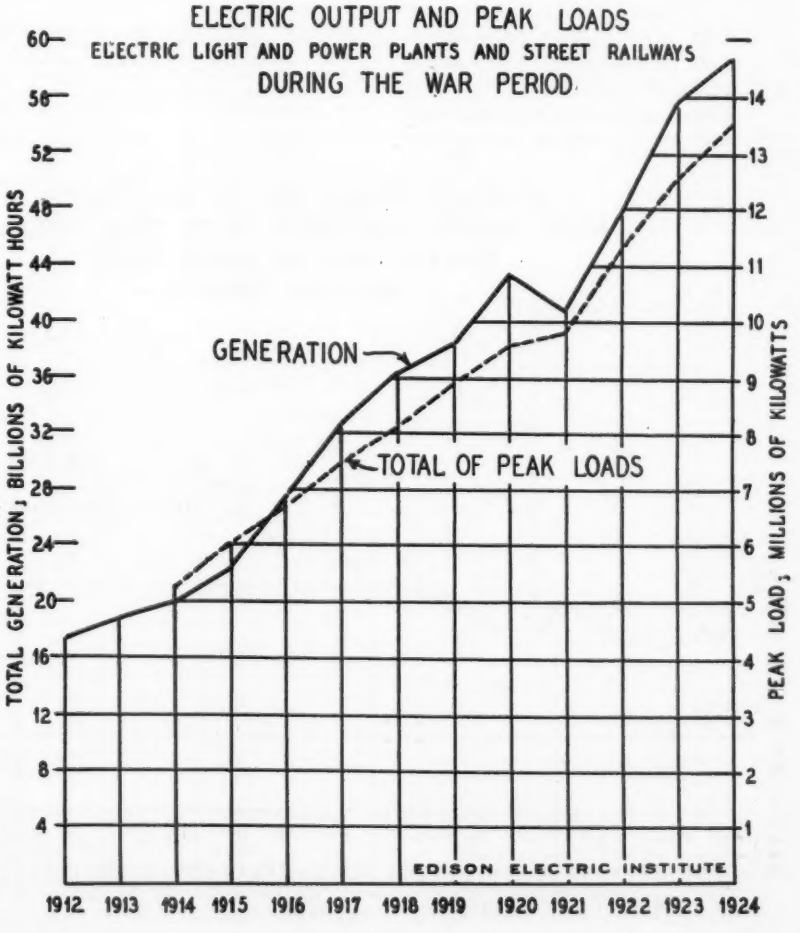
More than anything else, however, the figures emphasize the results of the latent demand for service by a young and vigorous industry that was then well into its period of maximum growth.

The table also shows the arithmetical sum of the non-coincident yearly peaks and indicates that a considerable part of the war expansion appeared in the additional kilowatthours which were caused by industries working longer hours and night shifts and which did not contribute to an increase in demand. In any analysis of these peak loads and their relation to installed capacity it must, however, be remembered that this summation of non-coincident yearly peaks fails to show the advantages of the diversity factors which have been made available by the widespread interconnections of the post-war period.

It is apparent that, if it had been available, some additional power could have been sold, especially during the bitter cold wave of January, 1918. The reader may be interested in certain extracts from the official report of the War Department[2] which recall some important aspects of the situation and show how nature conspired with man's ineptitude:

New England

"The problem of power supply in New England, particularly in the winter of 1917-18, differed from that at Niagara and Pittsburgh. It was largely due to a shortage of fuel caused by neglect to prepare for war demand by extra storage in the summer and fall and accentuated by a very severe winter, preceded by a drought which had depleted the streams and the storage reservoirs of the hydro-



[1] The latest census figures are those of December 31, 1929, which show that, of a total of 42,798,911 horsepower of primary power in industry, 22,706,857, (or 53 per cent) consisted of electric motors operated on power procured from public utilities. The Census Bureau has not gathered these figures during the depression, but the author suggests that the ratio at the present time is about 2/3.

[2] "The Power Situation During the War" War Department Document 1039, Offices of Chief of Engineers. (Out of print).

electric power plants. The usual supply of coal to New England by sea was decreased by the activities of the Navy and the Fleet Corporation, which had requisitioned most of the ocean-going tugs, barges, and large equipment. Due to the very severe winter, railroad operation became difficult, particularly on account of the excessive movement of freight for Europe to the tidewater ports, causing congestion there and at the railway portals to New England, Albany, Poughkeepsie Bridge, and Hoboken. This made it very difficult to get coal through and the situation became desperate not only as to fuel for power but also as to coal for domestic purposes. Fuelless days were introduced by the Fuel Administration, practically shutting down industrial production and shipments, thereby giving a chance to clear the gateways and slowly dissolve the congestion of traffic." (page 65)

New Jersey:

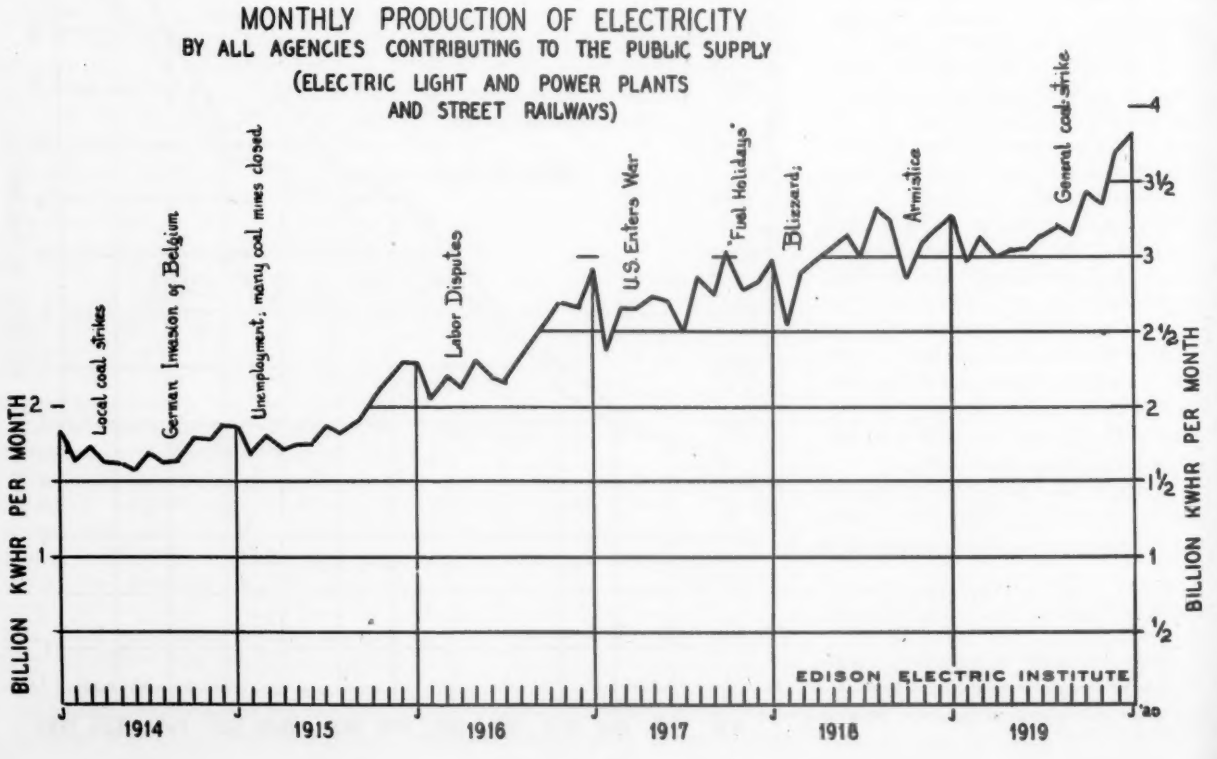
"The coal supply began to run short of the daily requirements early in November, 1917, and so continued until March, 1918. The utility company had provided about three months' storage and perhaps

TABLE I—GENERATION OF ELECTRICITY AND PEAK LOADS OF PUBLIC UTILITIES* 1912-1938

Year	Generation (million kwhr)	Non-coincident Peaks (thousand kw)	Load Factor %	Capacity, December 31 (thousand kw)
1912	17,575	.....	...	7,675
1913	19,000	.....	...	....
1914	20,375	5,325	43.7	....
1915	22,575	6,100	42.3	....
1916	27,900	6,700	47.5	....
1917	32,800	7,525	49.8	12,000
1918	36,200	8,100	51.0	....
1919	38,500	8,900	49.4	....
1920	43,334	9,600	51.5	14,372
1921	40,886	9,800	47.6	15,282
1922	47,521	11,300	48.0	15,949(a)
1923	55,555	12,400	51.1	17,433
1924	58,887	13,500	49.7	19,493
1925	65,571	15,300	49.0	23,512
1926	73,689	16,750	50.2	25,392
1927	79,365	17,500	51.8	27,021
1928	86,558	19,000	51.9	29,714
1929	95,925	20,100	54.5	31,623
1930	94,652	20,500	52.7	34,055
1931	90,729	19,900	52.0	35,370
1932	82,377	18,900	49.6	35,991
1933	84,736	19,100	50.6	36,243
1934	90,806	20,000	51.8	35,791
1935	98,464	21,750	51.7	36,074
1936	112,181	24,600	51.9	36,564
1937	121,837	25,350	54.8	37,134
1938	116,681	26,000	51.2	39,042

(a) Appears low; U. S. Census (which checked closely in 1927 and 1932) showed 17,286,272 kw for central light and power stations and electric railways for this year.

* Total generation of electricity by all agencies contributing to the public supply, as begun in 1919 by the United States Geological Survey and carried forward up to the present time by the Federal Power Commission. This includes the production of private and public "central station" electric light and power plants, electric railways, Reclamation Bureau plants, and certain manufacturing enterprises.



relying on the assurances of the Fuel Administration did not make the extra effort required to keep this unimpaired. However, neither the Fuel Administration nor the utility company foresaw the greatly increased demand for power and the unusual difficulties of fuel supply during the extraordinarily severe winter of 1917-18. The Railroad Administration had hardly had time to get a strong hold on its work, and the Fuel Administration was certainly new to its problems, when an exceptionally severe winter closed down on the country early and enormously increased the difficulties of shipping, transporting, and distributing coal and freight of all sorts. Water transportation was practically stopped by ice and by shortage of coastwise shipping. In spite of all efforts coal could not be supplied to meet the requirements of the district, and several occasions arose during the winter when the supply of power was cut off for days at a time. The Fuel Administration gave as the reason for the acute situation that it was caused by the unprecedented weather preventing the railroads from furnishing cars and locomotives to coal mines supplying New Jersey points. In consequence it estimated only about one-fourth of the normal production was shipped from the mines." (page 71)

Pacific Coast:

"In California it was found that during the period from 1916 to 1918 precipitation in the mountains had been notably low. In consequence, only a small amount of water had been stored by the larger hydroelectric systems of the State, causing a shortage of hydroelectric power for the industrial districts. It was therefore necessary to operate steam stations for long periods at high loads, resulting in a heavily increased consumption of fuel oil and a higher cost of production of power, in spite of which the hydropower resources were gradually being depleted.

"This condition continued until there was an extremely low hydro reserve on the various systems and they were in danger of a shortage. This condition was most serious in the northern part of the State, and the power companies, with the approval of the railroad commission, had appointed a power administrator for distributing the available power in the most effective manner. Power was allocated in accordance with the importance of the industry, following the procedure laid down by the priorities committee of the War Industries Board. It was necessary to curtail power to electric railways, to manufacturers of cement, for gold-dredging companies, and for hydraulic mining. Lightless nights were introduced and a few small classes of industries were shut down during the serious shortage." (page 83-84)

"The city of Seattle had been particularly active in supplying power for war purposes and soon found itself unable to meet the demand. There was no shortage of power on the lines of the utility company, however, and a considerable load could be provided by combining it with the systems of the two cities (of Seattle and Tacoma)—The city of Seattle, however, objected to interconnecting with the utility system, the difference being one of rates to be allowed the company. The city was also desirous of developing a water power supply on the Skagit River —which would have taken a long time and in the meanwhile did not provide for the power shortage—the interconnection between the city and the power company was therefore insisted on." (page 83)

Southern States:

"During the investigation made by the power section before the war ceased, due to unprecedented drought, a severe shortage of power took place in North and South Carolina. This shortage made it necessary to administer the supply of power available by applying the rules of the priorities committee of the War Industries Board. This was done by curtailing the supply of power to cotton mills and calling on all the industrial plants connected with the power system but having their own steam plants to operate them." (page 87)

NOTES

For the benefit of the mathematically inclined, the following methods were used in the computation of the figures:

(1) The *Electrical World* for many years gathered monthly data on output and revenues from representative samples of the industry. Unfortunately, these samples were not always the same from month to month, nor were the identical months the same when reported in subsequent years (for example, in 1917 56% of the industry reported for August an output of 1,260 million kwhr, whereas in 1918, 63% of the industry reported an output of 1,452 million kwhr for August, 1917. Extended to 100%, the 1917 report indicated a total of 2,250 million for that month, while the same month, reported a year later, showed 2,305 million). To overcome this, the annual totals shown in the table on page 35 of the War Department's report were taken as correct and the monthly figures selected so that the 12 months added up to these totals.

(2) In these earlier years, the Census of Central Electric Light and Power Stations covered only a fraction of the total business of generating and selling electricity. By faulty classification, many important companies appeared as "Street Railways". This has bedevilled the statistics of the industry to a considerable degree because some of the apparent growth of the Light and Power Stations during these years was merely the result of taking some companies out of the Street Railway class and putting them where they should have been in the first place.

GENERATION OF ELECTRICITY BY PUBLIC UTILITIES (U. S. CENSUS)

	Millions of Kwhr			Central Stations
Year	Central Stations	Street Railways	Total	% Total
1912	11,569	6,002	17,571	65.8
1917	25,438	7,241	32,679	77.8
1922	40,292	6,473	46,765	86.2

To overcome the distortion caused by using "Central Stations" alone, a total of 32,800 millions kwhr was used as the base figure for 1917 and the extended months and years of the *Electrical World* reports were multiplied by 1.227 (which was the ratio between the 26,736 shown by the War Department and the 32,800). Incidentally, this total of central stations plus railways (with a small addition of Reclamation Service and "non-utility" plants) constituted in 1919 the series begun with the U. S. Geological Survey.

(3) The "peaks" were calculated as follows:

The *Electrical World* published on April 25, 1925, an extensive tabulation entitled "Data on Output and Peak Loads of Largest Generating and Distributing Companies in the United States and Canada" from 1915 to 1924. Data for most of the companies shown for 1915 were given for 1914 in a tabulation appearing in the *Electrical World* of March 27, 1915 (page 826) and all have appeared in subsequent years in the large tables issued annually by the same publication. From these tables the total load factor of the listed companies was calculated for each year and the annual peaks computed by applying this load factor to the total kilowatthours shown in the first column of our table, on the assumption that the companies listed constituted a representative cross-section of the entire industry.

The years 1929 and 1938 were computed by the Statistical Department of the Edison Electric Institute and have been extended to cover the Federal Power Commission's figures of total generation.

It is not mathematically possible to arrive at any exact figure for a *simultaneous peak* over any large section of the country, but the author suggests that, for the United States as a whole, the maximum figure on the year's heaviest day would now be about 90 per cent of the sum of the non-coincident peaks given on the chart.

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"WITH less than two months to go it is time that all in our industry who might derive benefit from our annual accounting get-together become Conference minded. It is particularly imperative that those among us who have voluntarily accepted obligations to work on Committees and to whom has been delegated the task of undertaking research and preparing papers, proceed promptly with their assignments. The success of the Conference is entirely dependent upon them.

"I urge that each reader of the accompanying Conference article do his part in passing the word along to those not yet acquainted with the Institute's accounting activities, pointing out the benefits to be derived from attendance at these Conferences."—B. S. RODEY, JR., *Chairman,* General Accounting Committee, E.E.I.

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Third National Accounting Conference November 13, 14, 15, Chicago, Ill.

THE accountants of the electric utility industry are again getting ready for their annual get-together, which this year will be held under the sponsorship of the Edison Electric Institute at the Edgewater Beach Hotel in Chicago, on November 13, 14, and 15.

Although young in years, this Conference has achieved an enviable place among the national meetings of utility men as well as accountants outside our industry. This is due not only to the energetic efforts of an exceptionally capable Planning Committee, but largely to the enthusiastic cooperation of our accountants who look forward to this gathering as a principal means of keeping up with the progress in their profession, of learning the answers to particularly knotty problems troubling them at home, and, perhaps most important, of acquiring that fresh viewpoint that comes from personally meeting the key men in their profession. Judging from the response not only in the United States, but abroad as well, it seems safe to predict that last year's attendance of over six hundred will be far exceeded, if not even doubled, although, as one writer from Bermuda, who greatly enjoyed his visit to the Conference at Detroit, recently put it, "if the world is unfortunate enough to have a general European War break out, it is quite likely the undersigned will not be able to attend this conference."

PLANNING COMMITTEE

The Planning Committee, according to Mr. H. L. Gruehn, its Chairman, realizing the intimate relationship that marks the problems affecting the work of accountants in all utility fields, not only cordially invites but earnestly urges that their colleagues, especially those serving the gas, water, and steam industries, attend this Conference. The Committee is confident that no one can participate in the Conference without reaping substantial benefit, as not only the foremost accountants in our industry but also outstanding outside experts, among them representatives of the American Institute of Accountants and the Controllers' Institute of America, have accepted invitations to speak.

WHAT HEREDITARY MISCONCEPTIONS AND MISREPRESENTATIONS WILL FALL BY THE WAYSIDE IN THE "ACCOUNTANCY OF TOMORROW"?

•

IS GAS REALLY A STEP-CHILD IN COMBINATION COMPANY ACCOUNTING?

•

HOW COULD PENSION PLANS BE COORDINATED WITH SOCIAL SECURITY PROVISIONS?

•

DO YOU KNOW HOW SOME OF OUR COMPANIES ARE SOLVING THEIR ORIGINAL COST PROBLEMS?

•

WHO IS WINNING IN THE ENGINEER-ACCOUNTANT TUG OF WAR FOR THE RESPONSIBILITY OF KEEPING CONTINUING PROPERTY RECORDS?

•

ARE YOU FULFILLING THE IMPORTANT TASK OF AN ACCOUNTANT IN HELPING MANAGEMENT TO ACHIEVE & MAINTAIN A PROPER BALANCE BETWEEN CAPITAL PROGRAMS AND THE OPERATING RATIO?

•

Get the answers to these and many other vital questions at the National Accounting Conference in Chicago.

PRINCIPAL THEMES OF THE CONFERENCE

As in the past, the subjects treated in the general sessions will relate to the broader, non-specialized aspects of utility accounting. The principal themes will therefore be largely repetitive of last year's, dealing with possible economies in general and commercial accounting operations, complexities of present plant accounting regulations with proposals toward simplification, depreciation and original cost problems and experiences in their solution, and discussion of questions relating to the disposition of items in the so-called Acquisition Adjustment accounts. In addition, this year's Conference will review and discuss recent developments in regulatory requirements, certain misconceptions in developing the bases for the allocation of costs common to both gas and electric departments in combination companies, and possibilities for more effective organization in handling accounting matters which involve relations with other departments. The subject of the elimination of cost of permanent works and improvements from the Federal and State deficits will be discussed by an able authority on that subject together with the relation of depreciation of public works to public finance. The program will also include a presentation concerning the solution of today's accounting ills by the "Accountancy of Tomorrow."

In conformity with widely expressed wishes, this year's Conference will lay particular emphasis on the presentation of specialized subjects. It is therefore planned to devote only Tuesday and Wednesday forenoons to the general sessions part of the program, with a full day, Monday, and Tuesday afternoon being devoted to individual group meetings.

The Planning Committee has succeeded in securing outstanding speakers including those representing regulatory agencies and private business as well as speakers from our own industry.

The following are some of the specific topics which will be presented at the General Sessions on Tuesday and Wednesday:

Proper Organization for the Maintenance of Continuing Property Records from a Management Viewpoint.

Prescribed regulatory requirements for original cost and continuing property

WE SIMPLY OFFERED TO LET THEM RUN THE PLANT AND WE'D KEEP THE TAXES —
SO I TELLS THE COMMISSIONER SAYS I — "YO HONAR—"
REGISTRATION
"TEN HALLS IN THIS HOTEL AND THEY HOLD THEIR CONFERENCE AT THE REGISTRATION DESK"

records, and their more recent developments, have resulted in numerous problems particularly in regard to the extent of clerical work and record details and the scope of the various units of property and sub-classifications involved. Some companies have encountered considerable difficulty in their endeavors to properly organize for this work and to definitely assign responsibilities for its accomplishment. An executive of an operating company which has achieved unusual success in this field will give the Conference the benefit of his company's experience in these matters. It is expected that the views of this speaker will go a long way toward the ultimate solution of the problem.

Is Gas a Step-child in Combination-Company Accounting?

Statistics derived over a period of years from the Industry's financial statements indicate that gas departments in combination gas and electric companies are earning a comparatively lower rate of return than that reflected by independently operated gas companies. Likewise, the electric departments of combination companies show a comparatively higher rate of return than is indicated for independently operated electric companies. What is the reason for this apparent inconsistency? Is it perhaps due to certain inconsistencies in accounting allocations of expenses common to both gas and electric departments of combination companies?

Coordination of Pension Plans with Social Security Provisions.

A nationally known corporation, not in the utility business, has studied the effect of the Federal and State Social Security Laws on its company pension plan with a view to its coordination with the provisions of the law. The results of its research and conclusions should be of considerable interest.

What Hereditary Misconceptions and Misrepresentations will Fall by the Wayside in the "Accountancy of Tomorrow"?

Does the result of existing accounting theories cause misunderstanding of financial statements on the part of the laymen and investors? For example, is it correct to reflect plant and property in dollars on a financial statement with the inference that there is any possibility of any substantial conversion or realization of such assets in terms of money, or that those dollars reflect value in any sense of the word other than may be reflected by the earning capacity of those assets? Should the future balance sheet merely reflect the general character of the companies plants and properties together with a statement of the moneys that have been invested in their construction and establishment?

Another new development of growing importance is the linking together in financial statements of certain information now indicated on the balance sheet with statements of current earnings and expenses. The rapid development in recent years of the financial statement characterized as "source and disposition of funds" during periods of from one to five years as an aid to management, will be discussed. The ultimate affect or impact of economics on accounting may also receive some treatment under this subject.

To insure the most authoritative treatment of a subject developed largely

outside our industry a speaker sponsored by the American Institute of Accountants will give his version on some of these features of the "accountancy of tomorrow."

How Some of our Companies are Solving Their Original Cost Problems.

As companies proceed to comply with the new rules and regulations of the Federal and State Commissions in effecting original cost determinations, the specific problems involved become more apparent and more understandable. Some of these troublesome problems will be discussed by a competent speaker who will indicate what he deems to be their common sense solution. The proposed disposition of both debit and credit items in the Acquisition Adjustment Account will undoubtedly be discussed in this connection.

Are you Fulfilling the Important Task of an Accountant in Helping Management to Achieve and Maintain a Proper Balance Between Capital Programs and the Operating Ratio?

Under this heading there will be discussed the relationship between revenue and property, and the relationship between operating expenses and revenue together with the reciprocal effect of these ratios on the rate of return, indicating the very considerable change in the nature of the utility business during the last decade. The speaker on this subject holds the view that the effect of these changes has a very definite significance to the accountant in at least two particulars; first, as suggesting very clearly the broad viewpoint which he should follow in determining which amounts to capitalize as property and which to absorb in operating expenses; second, in stressing the importance of the accountant's task in aiding management to achieve and maintain a balance between capital programs and the operating ratio.

Depreciation

The general sessions program this year will continue to include speakers of prominence on proposed solutions and complexities of the depreciation problem. At least one of these speakers will be from the ranks of the regulatory bodies. While less time will be devoted to depreciation this year, the planned presentations are expected to be of unusual interest.

Effective Control and Inventory of Floating Capital—Materials & Supplies.

A re-emphasis of effective means of controlling materials and supplies and the adequacy of present inventory methods in respect thereto is deemed to be necessary. It is expected that the speaker on this subject will demonstrate specifically some of the inadequacies of various types of control and outline possible improvements. The general need for better coordination of stock and procurement control must now be recognized. Some companies or establishments handling great volumes of materials are known to have been highly successful in the adoption of standard stock catalogs which facilitate procurement, stock storage, and inventories. The foregoing are typical of the problems to be discussed at this session.

Elimination of Duplication in the Furnishing of Statistical Data to Governmental Agencies.

Last year a splendid outline of the voluminous statistical detail required by various governmental agencies was presented by a member of our industry at this session. A representative of the Federal Government will outline their efforts toward coordination and elimination of unnecessary reports.

Economies in Commercial Accounting Operations.

An executive will outline the success of his company and the methods employed in effecting economies in the field of customers' relations and commercial bookkeeping. This should be of unquestionable interest to the industry inasmuch as a major part of the cost of accounting in the utility business is at-

IMPORTANT

- ***All*** **accountants and all others engaged with or interested in public utility accounting work are cordially invited and urged to attend.**
- ***The Registration desk*** **will be open from 8 a.m. to 6 p.m. on all Conference days and also on *Sunday evening for the convenience of early arrivals, from 3 p.m. to Midnight.***
- **Make hotel reservations direct with the Edgewater Beach Hotel in Chicago *now*.**
- **A complete program of the Conference will be issued one month in advance and published in the next (October) issue of the E. E. I. BULLETIN and will also include the program of the specialized group committee meetings.**
- **An informal dinner will be held on Tuesday evening, November 14, and all those attending the Conference are welcome.**

HE'LL ONLY SPEAK THREE MINUTES, ELMER SAYS, AND IT'LL WOW THEM
---- AND NOW LET US GET DOWN TO SOME OF THE MORE KNOTTY PROBLEMS BLA! BLA! BLA!!!!
EXIT
SPEECH
TEMPUS FUGIT - CHAIRMAN FIDGET

tributable to this important field of accounting.

Scope of Responsibilities of a Controller.

In recent years there has been a national tendency toward the realization of more adequate definition of the scope of the responsibilities of a Controller or a chief accounting officer of a corporation. A speaker, affiliated with the Controller's Institute of America, will indicate some of the more modern concepts in respect to this matter also touching on the desired qualifications of trained accounting personnel reporting to the Controller. It is expected he will likewise treat with the much needed professional characteristics of accountants inside the industry.

SPECIALIZED COMMITTEE MEETINGS

In addition to the foregoing topics which will be presented at the general sessions program, each of the specialized accounting groups of the Institute will have its own comprehensive agenda, papers, and discussions which can only be summarized here. These group gatherings, instead of dealing with matters of broad accounting interest, will devote themselves to the study and discussion of specific procedures and the accounting mechanics necessary in the solution of their everyday problems. Judging from past experience, a very important part of the Conference's work will be accomplished at these "let's-come-down-to-cases" meetings.

General Accounting Committee

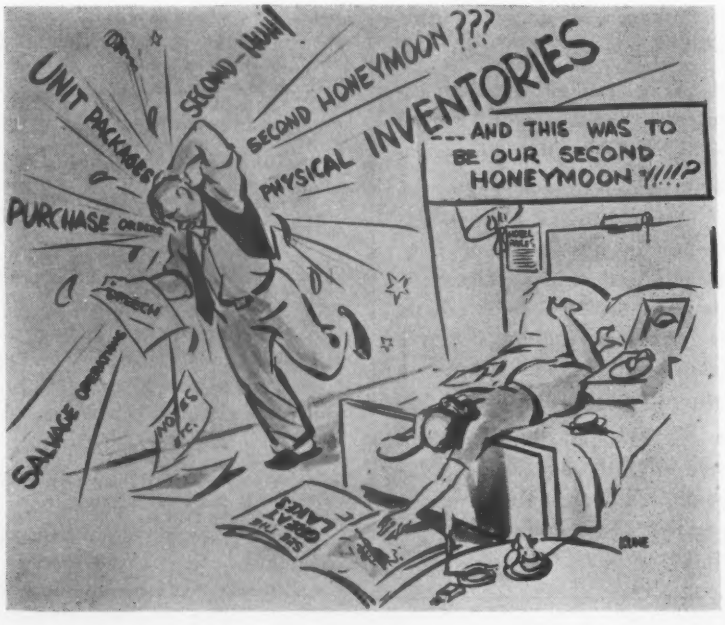
The scope of activity of the General Accounting Committee at the Conference will continue to be of an advisory and coordinating nature. An informal luncheon meeting has been arranged for the members of this committee, at which there will be a general review of the accounting activities of the Institute by the Chairman, and an opportunity will be afforded the members to discuss ways and means for further stimulating interest in accounting activities of the Institute.

Classification of Accounts Committee

The scope of this Committee's activities has been revised, in general, to include topics and subjects which are not specifically assigned to other specialized groups or committees. This, of course, is in addition to the Committee's important regular assignment of dealing with Federal and State commission organizations in matters concerning interpretation of accounts and provisions of the Uniform System of Accounts. Among the general topics which this Committee plans to have on its agenda for study and discussion in Chicago, will be Relation of Account Classification to Control of Expenditures, Public Interest in Balance Sheet Accounts, Classification of Operating Revenues, Maintenance Charges in Systems of Accounts, Accounting Provisions for Merchandising, Jobbing, and Contract Work, Methods used in preparing the Federal Power Commission Annual Report—Form 1, Internal Control and Audit Procedure, and Customers' Contributions for Extensions.

Customers' Relations, Commercial Accounting, and Collections Committee

The meetings of this Committee are always of especial interest even to accountants not immediately concerned with its activities. There is, perhaps, no other phase of utility accounting which offers a more fruitful field for possible economies. Some of the important topics



which are being developed by this Committee are: Uniform Treatment of Operating Costs Chargeable to Commercial Activities, such as Customers' Contracts, Meter Reading, Accounting and Billing, Credit and Collections, etc., Collection Procedures and Their Effect on Public Relations, Prompt Payment Discount vs. Collection without Discount, Two New Plans for Rewriting Meter Reading Sheets, Study of Ways and Means of Reducing Commercial Costs Through Elimination of Repetitive Routines, and many other topics, of particular interest to the delegates who are engaged in this activity.

Depreciation Committee

Perhaps the activities of no other Committee have been so prominent in our accounting circles as those of the Depreciation Committee. In the past year, representatives of this Committee have met twice with the Special Committee on Depreciation of the N.A.R.U.C. in a not entirely unfruitful endeavor to find some common ground regarding the basic principles involved. Progress reports covering the work of this Committee will be presented. Of particular interest will be the discussions concerning the recent depreciation report released by the N.A.R.U.C. Committee, which includes a summary of the answers to their ten-point questionnaire.

The subcommittee appointed to deal with the factual causes of depreciation will give a resume of its work including financial statistics concerned with the status of depreciation reserves within the Industry.

A subcommittee of engineers which has been recently formed to study the engineering phases of the depreciation problem will no doubt present a progress report of its activities.

Plant Accounting and Records Committee

This Committee is assembling what promises to become the most ambitious program in its history. Among the more important items which will be included for presentation and discussion at the Conference will be, Practical Phases of Original Cost Determinations, Consideration of Proposed Treatment of Debits and Credits Includible in the Acquisition Adjustment Account, and Simplification of Plant Accounting and Continuing Property Record Procedures. Other items of vital importance in this phase of the accounting work will be included in the program of this Committee.

Purchasing, Stores and Transportation Committee

The accountants in this division are at all times interested in giving management a true, reliable record of materials and stocks at a minimum of cost. The program of this Committee has been assembled with this thought in mind. A major topic to be presented will deal with the "Effective Control of the Materials and Supplies Inventory."

Another feature will be the discussion of a "Questionnaire relative to establishing a base for materials and supplies—stores expense—clearing rates" and the answers thereto furnished by electric companies throughout the East, Middle West, and South. This work has been enthusiastically received and has been called "an outstanding job in presenting a clear picture of a complicated subject" . . . "very helpful" . . . "in my opinion the best summarization of procedure on the subject that has been presented during my association activities covering a period of twenty years." Such praise, coming from accountants familiar with the subject, is proof that every progressive stores accountant owes it to himself and to his company to participate in the discussions of this Committee.

Programs of E.E.I. Engineering Committees Meetings in October

Prime Movers Committee

E. L. HOPPING, *Chairman*

THE fall meeting of the Prime Movers Committee will be held in the conference room of the Edison Electric Institute, 420 Lexington Avenue, New York City, on Monday and Tuesday, October 2 and 3. The meeting on each day will start at 9.30 a. m.

Final reports by the Chemistry, Combustion, and Turbine Subcommittees will be presented for review and approval by the committee. The Subcommittees on Boilers, Metallurgy, and Power Station Data will present progress reports.

The usual round table discussion will be held under the sponsorship of Mr. E. R. Crofts.

Arrangements have been made for an inspection trip of the two superimposed units now in operation at the Waterside Station of the Consolidated Edison Co.

Accident Prevention Committee

W. R. SMITH, *Chairman*

E.E.I. General Office, New York, New York
October 13 and 14, 1939

October 13—9:30 a.m.

Opening Remarks and Announcements
Minutes of Last (Eleventh) Meeting
Reports of Committees and Subject Sponsors
- Accident Statistics
- Cause and Location Data
- Public Safety
- Traffic Hazards
- Line Hazards
- Low Voltage Hazards
- Linemen's Handbook
- Principles of Hold-Off
- Employee Training
- Employee Health
- Resuscitation and Mechanical Counter-Shock

October 13—2:00 p.m.

Reports of Committees and Subject Sponsors
- Rubber Protective Equipment for Linemen
- Electric Fences
- Office Hazards
- National Electrical Safety Code
- A.S.A. Code on Safety Signs
- Protective Equipment (Miscellaneous)
- Miscellaneous Subjects

Reports of Liaison Representatives—E.E.I. Committees
- Electrical Equipment Committee
- Insurance and Accounting Committee
- Prime Movers Committee
- Hydraulic Power Committee
- Transmission and Distribution Committee

Reports of Liaison Representatives
- National Safety Council
- American Institute of Electrical Engineers —Committee on Safety

Discussion of Specific Accidents

October 14—9:30 a.m.

Discussion of Conditions Under Which Work in Vicinity of Operating Equipment is Done:
- Taping, etc.
- Watchers

New Ideas, Devices, Procedure, Methods, Reports on Results of Tests, etc.
New Business
Committee and Sponsor Appointments
Selection of Time and Place for Winter Meeting:
- Suggestions of topics therefor

Adjournment 12 Noon Saturday, October 14

Electrical Equipment Committee

H. L. WALLAU, *Chairman*

New Ocean House, Swampscott, Mass.
October 9 and 10, 1939

October 9—10:00 a.m. Closed Session

(Only Committee Members and Representatives of E.E.I. Member Companies are invited to this session)

Apparatus and Design Division

B. VAN NESS, JR., *Chairman*

Oil Fire Reports ..... R. N. CONWELL
- (a) Discussion of Recent Oil Fires
- (b) Fire Protection Practices

Apparatus and Transformer Vault Troubles ..... C. A. CORNEY
- (a) Report on Equipment Failures
- (b) Transformer Vault Troubles
- (c) Informal Discussion of Apparatus and System Troubles

Joint Committee, Oil Circuit Breaker Reports ..... R. W. WILBRAHAM
Exciters for 3600 r.p.m. Generators
Hydrogen Cooling for Totally Enclosed Machines

October 9—2:00 p.m. Open Session

Foreign Practice Group

A. V. DE BEECH, *Chairman*

Report ..... A. V. DE BEECH
D-C Transmission ..... C. M. GILT

Apparatus and Design Division

B. VAN NESS, JR., *Chairman*

Modernization of the Schuylkill Generating Station Switchhouse, Phila Elect. Company ..... R. A. HENTZ
Experience with Gaps for System Equipment ..... A. E. SILVER
Résumé of the General Electric Co.'s Circuit Breaker Demonstration at Schenectady on Aug. 17, 1939 ... N. STAHL
General Round Table Discussion

October 10—10:00 a.m. Open Session

System Engineering Division

R. A. HENTZ, *Chairman*

Generating System Capacity Reserves ..... H. C. FORBES
Basis of Investment for Increased Reliability ..... S. M. DZAN
Announcements and Recess

Operating and Maintenance Division

H. S. FITCH, *Chairman*

Progress Report ..... H. S. FITCH

Utilization Division

J. H. FOOTE, *Chairman*

Progress Report ..... J. H. FOOTE

October 10—1:30 p.m. Joint Session

With Transmission and Distribution Committee

Ratings for Use in Registration Statements ..... P. SPORN
Ground Fault Neutralizers
Application and Use ..... E. M. HUNTER
Discussion by
G. H. FIEDLER and R. N. CONWELL
Radio Influence Factors of Apparatus ..... M. D. HOOVEN
Utilization Voltages ... J. H. FOOTE. *Sponsor*
Resistance Type Welders ..... L. W. CLARK
Progress Report Meter and Service Committee ..... A. E. SILVER, *Sponsor*
Continuing Property Records ..... A. A. LIPSCHUTZ
Emergency Radio Communication ..... H. L. DAVIS, JR.

Transmission and Distribution

W. F. NIMMO, *Chairman*

New Ocean House, Swampscott, Mass.
October 10 and 11, 1939

PRELIMINARY MEETING—October 9
9:30 a.m.-5:00 p.m.

Subject Committee on Underground Methods and Accessories
J. A. BROOKS, *Chairman*

Recent Gas Filled Cable Installations in New York ..... E. R. THOMAS
A Buried Split Fibre Duct System of Secondary Residential Distribution ..... W. B. ELMER
Adoption of Varnished Cambric Insulation for Cables in Vertical Runs on the Detroit System ..... G. B. MCCABE
Discussion of the influence of the mechanical characteristics of cables on load carrying capacity ... W. F. DAVIDSON
Discussion on four Underground Group papers presented in Chicago last May

REGULAR SESSIONS

October 10—9:30 a.m. Open Session

Underground Group
Adjournment at 10.30 a.m. for meeting of Subject Committees during the remainder of the forenoon session on:—
Distribution Transformer Standards ..... A. E. SILVER
Timber Products ..... L. G. SMITH
Field Load Testing of Distribution Transformers ..... F. E. SANFORD
Street Lighting ..... W. B. ELMER

October 10—1:30 p.m. Joint Session

Joint Meeting of Transmission and Distribution and Electrical Equipment Committees

(See Electrical Equipment Committee Meetings for this program)

October 11—9:00 a.m. Open Session

Sandards and Specifications Group ..... E. V. SAYLES, *Chairman*
Distribution Transformer Standards ..... A. E. SILVER
Crossarm Specifications ..... L. G. SMITH
Hardware Specifications .... E. V. SAYLES
Suggested Specifications ..... E. V. SAYLES
Plant Coordination Group ... W. F. DAVIDSON
Cooperative Projects Group .. M. D. HOOVEN
Transmission Group ..... D. M. BUNN

October 11—2:00 p.m. Open Session

Overhead Distribution Group ..... G. H. FIEDLER, *Chairman*
Secondary vs. Primary Capacitors ..... F. M. STARR
Field Load Testing of Distribution Transformers ..... F. E. SANFORD
Allowable Loading of Distribution Transformers ..... H. P. SEELYE
Report on Activity of Street Lighting Committee ..... W. B. ELMER
A Street Lighting Standardization Plan ..... F. W. NIMMER

October 11—3:45 p.m. Closed Session

Discussion of Revision of National Electrical Safety Code

Commercial News Notes

E.E.I. Rural Service Division Established

By C. E. Greenwood
Commercial Director, Edison Electric Institute

AFTER many years of active promotion of rural electrification through committees of the old National Electric Light Association and of Edison Electric Institute, there has been established a Rural Division in the Commercial Department of the Institute for the coordination of rural activities. Our Association has been the source of statistical information on farm electrification; its committees, which include members who were authoritative leaders in the technical and commercial fields, have produced a fund of valuable information which has been contained in numerous committee reports.

The new Rural Service Division will act as a clearing house for information concerning rural electrification subjects; it will issue publications from time to time and motivate national promotional programs for the stimulation of coordinated effort to encourage more complete electrification of rural customers of the utility companies.

The new Head of this Division is Joseph P. Schaenzer, recently Assistant Director of the Committee on the Relation of Electricity to Agriculture. Mr. Schaenzer studied engineering at Marquette University, and later he was graduated from State Teachers' College, Wisconsin, in 1916. He received his degree of B.S. from the University of Wisconsin in 1921. Following graduate work in the same University he became project director in Rural Electrification for the University of Wisconsin in which position he continued for five years.

In the interim between his service with the University and his connection with CREA, Mr. Schaenzer served as superintendent of Emergency Conservation Work Camp at Evansville, Wis.; as soil conservation specialist with Soil Conservation Service at LaCrosse, Wis.; and agricultural and irrigation engineer for Federal Power Commission, Washington, D. C. In 1935 he prepared a comprehensive report on rural electrification in the United States, showing the potential market for rural lines and electrical equipment for every county in the nation. Later he was with the Rural Resettlement Division of the Resettlement Administration, Washington, D. C. He has published many feature articles on rural electrification subjects.

JOSEPH P. SCHAENZER
Heads new EEI Rural Service Division

The Rural Service Division started to function on September 15.

* * *

With the success of the Running Water Program of the Electric Water Systems Council, now in its sixth year of effective operation, the urge has been for a continuation of the activity. The Council is about to call its fall meeting to determine plans for 1940. Over 400,000 booklets containing the story of Running Water have now been distributed to prospects for electric water systems. The story has also been adapted to the sound slide film, and a most recent development of the Council is a radio transcription record which is offered at a price of $5.00 each. There is opportunity at both the start and at the completion of the record for local announcements. The cast is well chosen and gives an entertaining presentation of the more healthy and comfortable living that is assured in the farm home after the installation of a water system.

* * *

The Dairy Farm has been selected as the next objective for modernization in electrification. If present plans mature, the organization of an Electric Dairy Council will be perfected and in operation before the first of the year. This will be a joint effort between the utility companies of Edison Electric Institute and manufacturers of electric dairy equipment. There are thousands of dairy farms to be modernized and the potential market for dairy equipment is extensive. The program offers opportunity for educational and social advantages in addition to the economic aspects. Production of better milk is in the public interest, and the electrified dairy will prove a profitable investment for the farmer.

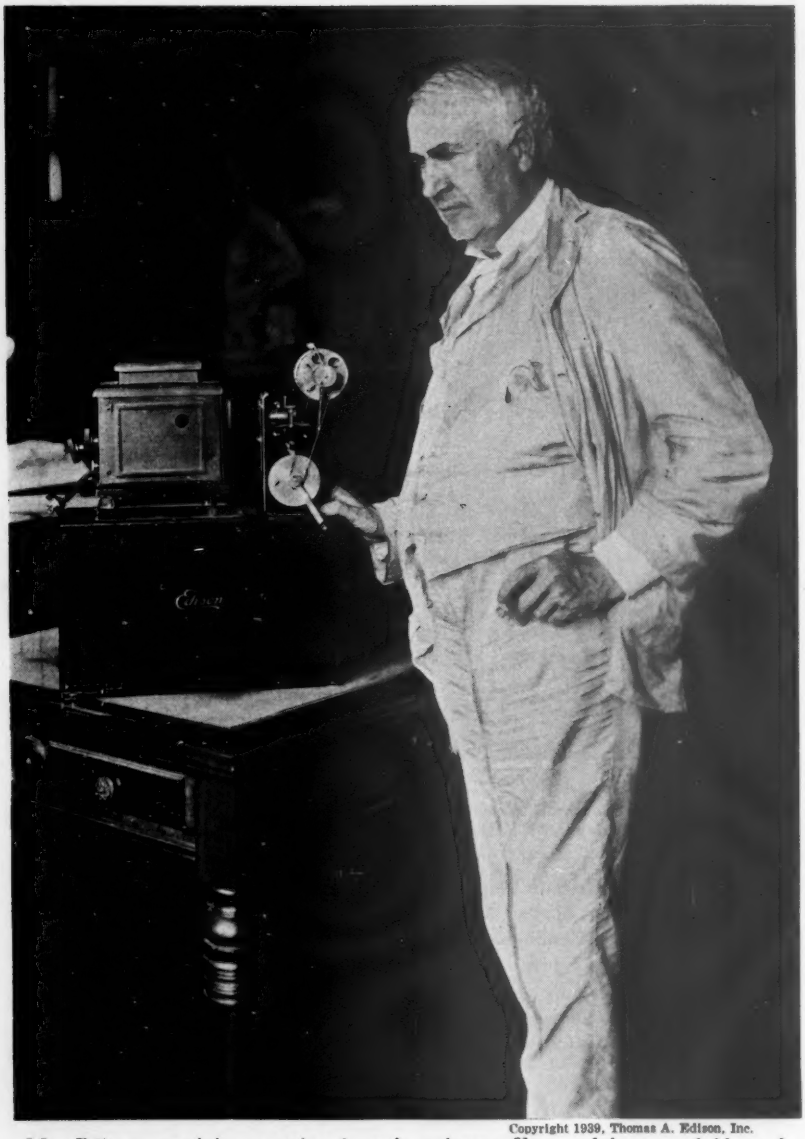
The potentialities for a successful promotional activity are obvious.

* * *

Washer and Ironer Week

October 14 to 21 has been chosen by the American Washer and Ironer Manufacturers Association for National Washer and Ironer Week. The President of the Association, W. Neal Gallagher, states that "Our first country-wide promotion event, staged last Fall, produced the greatest single week's retail sales in the industry's history." The utilities have opportunity to again tie-in with this aggressive sales and promotional effort of the manufacturers through local participation and coordination with the dealers, and to help roll up another impressive sales record. The utility wants the Electric Home Laundry. There are many homes without the essential washing machine and ironing equipment, and thousands of washing machines should be replaced which are now out of commission because of need of repair or through obsolescence.

One way of participation is to join in the window display contest for which national prizes are offered in the utility class. Local newspaper advertising should bring most productive results dur-



Copyright 1939, Thomas A. Edison, Inc.

Mr. Edison examining a strip of motion picture film used in one of his early motion picture projectors

ing this peak activity of national and local advertising promotion.

* * *

The Movie Industry Celebrates

October is the anniversary of two great inventions from the same fertile brain. One, the Sixtieth Anniversary of the Incandescent Lamp; the other, the Golden Jubilee Celebration of the motion picture machine. Although everyone in our industry readily associates Thomas A. Edison with the incandescent lamp, many fail to recall that his Kinetoscope, which he built for the purpose of providing visual accompaniment for his phonograph, was the basis of motion picture mechanisms of today.

October 6, 1889, is considered the birthday of the motion picture machine and it is fitting that the electrical industry tie-in with the motion picture industry to help celebrate the event.

The electrical industry features Better Light through Better Sight in THE DAWN OF A NEW DAY in October, announcement of which has been widely proclaimed. There is ample room to aid our customers in the motion picture industry. It is suggested that in hundreds of window displays of utility companies there be reminders of the "old" and the "new" to call public attention to this important milestone in the progress of the "movie" art. Local motion picture theatres will be found cooperative in aiding in this promotional effort. Notice has been sent to commercial executives of utility companies.

The incandescent lamp and the electric appliances that followed it helped to contribute leisure hours to millions of people, and the motion picture industry has made startling contributions in ways to enjoy that leisure.

* * *

Over the Top

Aggressive selling of electrical service, which can only result from sustained selling and promotion of electric equipment through which that over-all service can be given, has been in progress for a long term of years. In process of building energy consumption in the American home, there has been sustained education in the social and economic aspects of the use of electrical equipment as a background to product selling. As a result, we have noted from year to year the mounting totals in average energy use per home.

For the twelve months' period ending June 30 the average per customer stood at 878 kwhr with an average revenue of 4.15c per kwhr and an average bill of $36.44. There is a substantial list of companies that have exceeded the thousand mark, but the Philadelphia Electric Company is the first large Metropolitan company to go over the top. That company reached 1000 kwhr average per home for the year ending July 31, 1939. It is significant that this growth has come during the years of economic instability. In 1929 the average domestic use was 498 kwhr and the average cost per kwhr 6.44c. Ten years later it crosses the 1000 mark with an average cost of 3.67c per kwhr representing a reduction of 43 per cent.

Philadelphia is an example of what other electric companies have done, and what all companies can do, through planned, vigorous promotional and sales effort. Its cooperative work with the electrical appliance dealers has been outstanding and it is estimated today that 57 out of every 100 customers on the lines of Philadelphia Electric Company have an electric refrigerator, six out of every 100 have an electric range and three, an electric water heater.

In the past decade there have been sold approximately 400,000 electric refrigerators, 44,000 electric ranges and about 23,000 electric water heaters throughout the territory served, with an aggregate merchandising value of $80,000,000. When one considers the mil-

lions of dollars worth of other good sellers in the appliance list that were added such as washing machines, vacuum cleaners, radios, irons, table cookery items and lamps, and the business involved in the production and distribution of these products together with the facilities for supply, one realizes the stupendous contribution that aggressive selling makes to Business and to public welfare.

* * *

Air Conditioning Report

The long deferred Statistical Report on air conditioning installations is now being distributed by the Institute. It is the most complete survey yet published and includes the reports of 141 companies covering many times that number of communities. It is the first report of its kind broken down into business classifications.

There are utility companies that have not kept active records that will make local surveys and the next report issued by the Institute should have a larger number participating. This Report containing exhibit sheets for each company is selling at $1.00 per copy.

* * *

Sales Training

The Sales Training Committee of Edison Electric Institute will offer next month a Customer Relations course of five sound-slide films, including a Leader's Manual for each, which have been prepared by Vocafilm Corporation for company use. Watch for announcement.

* * *

Lamp Campaign

The principles of Better Light-Better Sight embodied in the certified line of IES lamps have made these one of the best sellers. Somewhat over 4,000,000 of the tagged lamps of the Better Sight Lamp Makers have been sold to date and probably an equal number which follow the technical specifications without designation.

The entire lighting industry is lined up to make 1939 close the peak year in the sale of these IES lamps. A powerful national advertising campaign in local newspapers has been started this Fall in 59 major cities in 39 States. The utility companies joining in the effort will either sell direct or line up dealers. The force of General Electric and Westinghouse Companies' interest in the Better Light-Better Sight movement is also behind the campaign. Utility companies are already in line for local coordination and the tie-in sweeps from Coast to Coast. All concerned in the production and distribution of the IES line of lamps can be assured of profitable business as our utility customers are convinced of their adaptability, plus their decorative and sight saving values in the home.

All-Electric Kitchens are in reach of all income classes

Exhibit of Central Hudson Gas and Electric Corporation, Poughkeepsie, N. Y. Kitchen at left costs $129.50 installed. At right, high-grade conventional kitchen, cost $1,110.00 installed.

* * *

Electric Mixer Demand

There is a prediction by government economists of increased demand and a boost in prices for farm products. War or rumors of war increase the demand for food supplies and there will be an increased demand for farm products in general.

Nevertheless the Farm Security Administration is pressing an intensive program of self-sustaining farm products. They are encouraging the low income farmers to produce butter, flour and clothing at home. It is of interest that Mr. Philip Henderson, Regional Director of the FSA for the eleven Northeastern States, recently put forward the Borsodi method of making butter at home (Ralph Borsodi, an economist of note).

Mr. Henderson says, "It was proved that the Borsodi method of making butter with an electric mixer is a simple, economical process. If the farmers made butter this way, in small amounts, it would take but a few months and save the cash outlay for the product."

Just another indication of the educational work to be done showing the farmer how he can help himself.

* * *

Low Cost Kitchens

It has been pointed out in numerous articles by H. E. Dexter of Central Hudson Gas & Electric Corp., Poughkeepsie, and Chairman of the General Sales Committee E.E.I., that the all-electric kitchen is in reach of the farmer who has low income and is unable to obtain for his wife the labor saving kitchen equipment for the home. There has been developed for this market by certain manufacturers, and built to specification, a small refrigerator, non-pressure hot water heater and now a roaster-range. These inexpensive combinations will perform the functions of the expensive units, omitting of course the electric dish-washing.

In order to visualize this oft-repeated message, the two types of kitchens were displayed by the local utility company in Poughkeepsie in a recent Exhibit as shown in the accompanying illustration. The electric kitchen at the left sells for $129.50. Please note the electric tea kettle included. At the right is the conventional type electric kitchen now being installed in so many of the better types of homes. This is indication of the study of selective markets that is now being given by utility companies.

The Lengthened Shadow of a Man

By H. L. Mitchell
President, West Penn Power Company

An address before the 32nd Annual Convention of the Pennsylvania Electric Association, Bedford Springs, Pa., Sept. 6, 1939

THERE were at least 10 young men in the West Penn Power Company's personnel office yesterday looking for a job. They are of the millions of employable age entering the business world since 1930. They have never experienced what we older ones term prosperous or normal times. This "lost generation" will rule America 10 years from now!!

But despite all handicaps of this younger generation and the generation preceding it, some men of each generation are still creating jobs and making money. On the other hand, many men have lost heart. But there are still boundless opportunities to create jobs and to make money, and we, in the electrical industry of Pennsylvania, can greatly assist in bringing this about.

Some business people have undoubtedly lost heart. The president of an important enterprise is reported to have said, "I am not collecting the money (he was writing about life insurance) and investing it. I am putting it into annuities for my wife and myself—but I figure that within a few years they will yield enough income to keep us in some kind of comfort throughout our old age." This man has lost heart.

The head of an advertising agency states, "I couldn't face another four years like the ones we have been suffering." And even the ambitious sons of successful men like these are taking up farming in a sunnier clime. They all think they are playing safe.

These men are representatives of big business. It is just as true, or more so, that many small businessmen are imbued with this same "no-heart, play-safe" attitude. Department heads within large companies have forgotten the spirit of enterprise and new ideas and refuse to "stick out their chins." Skilled workmen have placed protective devices around themselves is the vain hope of perpetuating so-called safety. Some unemployed men have quit trying to be useful, and college boys deprive themselves of the valuable experiences of working

MR. MITCHELL

their way through college if they have to, depending upon public sources for funds. These people have all figuratively "buried their heads in the sand."

As long as these few people maintain that attitude, competition from them is removed, creating still more opportunities for personal, individual enterprise.

Let's think for a moment what there is to lose heart about. Let's come down to cases. Many people who have made money or who have always been workers in the *steel business*, have the impression that there is no more opportunity for them. Certainly the facts should not give that impression. After Bessemer's basic patents expired in 1891, the steel business expanded by leaps and bounds because of the use of this man's method and thousands of other time-saving methods introduced by men in the industry. One of the outstanding man-conceived methods was the open hearth which produced twice as much steel as the Bessemer process. That occurred in 1910.

Even today, many new developments are taking place. Mr. Eugene Grace of the Bethlehem Steel Company says that one of the outstanding recent developments by men has been the development of high quality, deep drawn steel sheets which made the fender and the all-steel top of the modern automobile possible. Mr. Weir of the National Steel Corporation says the steel workers' tremendous development of better continuous rolling process has improved their products for better automobiles, refrigerators and radios. Charles Hook says that the development of the continuous method of rolling sheet metal in wide strips by the men of the American Rolling Mills Company has made available products of highly improved quality at lower cost and increased volume for ranges, washing machines, sanitary ware, etc.

All of these developments and thousands more are new processes and new machines put into useful production in the intervening years through individual initiative.

It was commonly thought that such technological improvements would replace many men but, as a matter of fact, instead of 480,000 employes in 1899, they had 775,000 employes in 1935, and instead of paying wages of $320,000,000 as in 1899, they paid $877,925,000 in 1935. That is 61 per cent more employes and 174 per cent more wages. It doesn't look as though inventions of individuals, materialized in new processes and new machines, have taken any jobs or wages from this industry.

Why, in 1939, this tremendous improvement has made the products of steel amount to one-half ton per year for every man, woman and child in the United States. The steel people certainly shouldn't lose heart, for there are undoubtedly thousands of opportunities for individuals in this industry.

Of course you know what the enterprising individuals have done for the automobile industry and for businessmen and employes—from 34,000 employes in 1904 to 479,000 employes in 1937. What a record for people with hearts!

Well, you might say, "What about other industries—the railroads, for example, or the oil and gas industry, or the farm machinery industry, or the tele-

phones and the telegraphs, or the moving pictures, or radio, or the newer industries—plastics, air conditioners, television?" You may well ask these questions. Probably the oldest of these industries is the railroad industry. I am sure that many of you feel that at least *that* industry might be in a deplorable condition and that the changes in the times have displaced many employes. But even in this industry there were 405,000 employes in 1921 and 480,000 in 1935. And the men with individual initiative in this field have produced streamlined trains, cars with the most modern personal comforts and gradual approach toward the American public's desires, so that they may evolve to a paying basis once again. They should not lose heart.

Perhaps you think that your towns and your territories and your businesses and your neighbors are different. There is little opportunity for them. Well, as the steel business, bituminous coal business, and glass business are what interest my neighbors, let me finish my references to them.

I have already shown the enterprising opportunities for men in the steel business. I wonder what the bituminous coal future looks like? Many say that the bituminous coal business is on the downgrade. The production figures between 1912 and 1931 for the bituminous producing coal states in America hardly show this to be true. By five year periods, starting in 1912, they produced approximately 2.3, 2.6, 2.4 and 2.4 billion tons respectively. Certainly no marked drop-off in this industry.

But there has been a switching of this business, largely from Pennsylvania to West Virginia and Kentucky. In other words, from the older production states to the newer production states. In our State of Pennsylvania we have gone down from 811,000,000 tons for a five year period ending 1916, to 629,000,000 tons for the five year period ending 1931. Since that time Pennsylvania production continues to drop off a little.

Now, the individuals in Pennsylvania in this business might easily have lost heart. But have they? Their record of installing coal cutting machines, mechanical drills, the most modern, highly efficient fans and the latest type of mechanical loading machines with high speed locomotives and ball bearing coal cars, and finally, cleaning plants, is a lesson to *any* man in *any* business.

Bringing this coal industry a little closer home to our electrical industry in Pennsylvania, a forecast as of July of this year indicates that West Penn Power coal customers will buy new equipment which will use electricity valued at a million dollars a year in the next five years. There is little reason to lose heart, for this survey shows that individual enterprise in this old industry will continue to create jobs and prosperity, both in their industry, the machine tool industry and in our industry.

And the glass industry is another one that interests my neighbors—milk bottles, pop bottles, beer bottles, pickle bottles, bottles and still more bottles. This industry as of 1935 employed a total of 223,000 people and in the doing thereof gradually eliminated 28,000 glass-blowers who had a habit of dying young through their lung-bursting skill.

Men who invented the automatic bottle making machine created the milk bottle and that in turn created the whole modern milk distribution system. A large part of the 130,000 wage earners in the canning and preserving industry owe their jobs to the men who invented the automatic glass container machine. In other words, in this industry, *men,* using their individual enterprise, produced the automatic bottle machine, displacing 28,000 people who were making bottles in an almost killing process, and now use 23,000 people making bottles, as well as giving supplementary jobs to a total of 200,000 people. Individuals in the glass business should not be losing heart.

I have already spoken of the men in the steel business, the coal business and the glass business, which are very interesting to my neighbors. But the stories of these men and their businesses are continually repeated in the industry of typewriters and office machines, the printing and publishing industry, etc., throughout the whole list of industries.

For instance, when Mergenthaler invented the linotype machine, he was criticized and opposed as a labor destroyer because it multiplied the output from five to ten times. And yet, this man, through his machine, made it possible for our wonderful newspapers to tell us the news of the world every day; he made it possible to bring the world's best thinkers within the reach of every one, and through advertising it is possible for us to tell our stories to people it would be impossible to reach in any other way.

Did this machine destroy labor? In 1880, before the machine, there were 1726 printers and compositors in the United States per million of population —today we have 2500 plus per million of population and the output is at least fivefold.

It is true that the practical imagination of American men in inventing machines and mechanizing their plants has not *always* added employment. In the boot and shoe industry, for instance, in the early days, when many people were without shoes, there were 5644 shoemakers for each one million of the population. It is doubtful that the present day shoemakers and those additionally employed in the hide and leather industry, due to the millions more shoes needed, equal the original number of shoemakers.

A man named McKay was the genius that gave shoes to all of us and that, incidentally, enabled the Union soldiers to be well shod. Perhaps it is sometimes better to give millions shoes than it is to keep the few shoemakers in their particular industry.

After all, there has been a tremendous increase in opportunities for men through the large number of new industries—television is new, electric organs are new, air conditioning is new, plastics are new, cigarettes are a practically recent new industry, radios are new, photography is growing by leaps and bounds, the moving picture industry is new, electrical refrigeration is new, together with the whole list of electrical appliances in whose development we have had so intimate a part, and so it goes. So that, although there are fewer shoemakers now employed than there were 70 years ago, there are many major industries and many more minor industries that have been continually creating new jobs—and we *all* have shoes.

Remember, ladies and gentlemen, this history of American progress is scarcely more than 100 years old. In that short time men like Eli Whitney and Bessemer and McCormick and Mergenthaler and Kettering and Edison have become names known to all of you, but for each one of these brilliant, well-known men there are thousands upon thousands of "unknown soldiers" of industry like you and me and our neighbors, who are continually adapting new and useful things, as well as creating new things.

Now, some say that we'll have a hard time to make any further improvements. That's exactly what was said 50 years ago. If any of us feels that way, see

what Mr. Eddie Rickenbacher says about airplanes, or Mr. Keller of Chrysler, or Mr. Sloan of General Motors concerning private transport. Or in the chemical field—Mr. Walker of the Commercial Solvents Corporation promises a new development which will open entirely new fields, a wide range of new industries through the development of nitro-paraffin, which was the conversion of waste material into an industrial product of first rate importance. And so it goes through the fields of communication; farms, fibers—on this subject, General Motors' book, "New Horizons of Industry," asks the question, "Will Nylon and Vinyon put the silkworm on relief?"—and promises clothes so cheap it won't pay to launder them. Foods—we're promised enough of the proper foods for everybody. The postponement of old age through health research; all electrical, dustless and germless homes; night turned into day with electricity; all drudgery removed from labor through machines. These, each and every one of them, are some of the boundless opportunities of the future for individual enterprise.

Let's look at what really made our communities. In the busy beehives of industry surrounding Pittsburgh, West Penn serves 950 communities of which 800 have a population of less than 1000 and only four with a population over 20,000.

What started these towns? Was it big business starting huge industrial plants that some of them now possess, or was it a few enterprising individuals in each one of these communities?

In one town a few men got together and decided a location was very favorable for some particular industry. They formed a land company. Their enthusiasm for the location became a part in the starting of one local industry. The original industry started by these local men was later acquired by the Carnegie-Illinois Steel Corp., but because the original land company individuals were right about the location, there grew up 15 other manufacturing plants through the vision and courage of these local men. This town had 28,000 people in 1929 and payrolls of nearly $2,000,000 which went to about 9000 workmen. Local individual initiative created this prosperity.

Of course, not all of our towns started their modern industrial life as did this town—some were first established as fortifications. Their industrial life was, in almost every case, started through some local pioneer. One of our towns was originally begun by a fellow named Jacob Sadler, who wore clothes covered with patches and crossed the mountains on a mule. He closed his original purchase of land by taking a sharp knife from a pocket and cutting the stitches of the patches. As each one was opened, money fell to the ground until there was sufficient cash to close the deal.

This same town was developed industrially by a glass-blower—an inventor, a builder and an industrial organizer. His name was Houze. He was working in a window glass factory in Ohio, soon became a boss blower and within a few years, began building and operating a window glass plant in Pennsylvania. His knowledge of methods, coupled with his inventive genius, made him in great demand as a builder of tanks and a designer of equipment for window glass factories. This man's whole life was a record of invention and enterprise. He is representative of one of the links between the very old and the very new—his lifetime covered a tremendous amount of changed development and improvement which he saw and was a part of. Through him and his inventions we have small glass pieces as covers for pictures, clock faces, instrument dials.

And the individual industries in other communities were started by one or two local men with not much more than brains and energy. The biggest stainless steel company was started in a little community by the vision and energy of an orphan boy—Mr. Sheldon, who died very recently—who began his career as a steel worker. The modern aluminum business was started by a young fellow named Hall, just out of school. He managed to enlist local aid and formed a company called the Pittsburgh Reduction Company. This plant has grown into the largest aluminum plant in the United States—The Aluminum Company of America.

Then there are the towns that have had their industrial boom, but have lost their individual initiative—they have become typical ghost towns, but even here some few men have not lost heart. One of our towns was once a center of intense activity in the oil business—reaching at one time a population of approximately 20,000 people. Later this town shriveled to a population of less than 1000. Here, again, one local man inspired two or three other men to do something about it and they built a plant for the manufacture of high grade bottles. This plant was later acquired by a larger glass company—it is still in steady operation, up-to-the-minute in its methods and furnishing employment to several hundred men. Another example of individual enterprise.

And individuals can do the same thing for towns as for individual plants even in these times. In one of our communities, during the depth of the depression in 1932, it was tagged "second worst hit community in the United States." Today they were employing nearly as many people as they did before the depression, although the kinds of industries have entirely changed. This comeback didn't grow over night; it was the result of a few people taking an inventory of what they had left after the disaster that would be useful to other industries. Out of it they were to start a new little industry of their own and to attract two other small industries who had had disasters and to rehabilitate one of the few industries that they had left.

With what results? Today the "for rent" signs have disappeared, padlocks are off the YMCA doors, theaters are playing to full houses and this community is again a thriving industrial community because of the old pioneering spirit of individual enterprise.

You may feel that this kind of thing cannot be done today with industrial men who have lost heart, but we have had the happy experience of seeing three men, with vision and foresight, take over an industry in 1934 when the old owners lost heart, find new products for that industry, and install new machinery as fast as their profits permitted. They now employ four times the number employed when the old management lost heart. Men can prosper today.

And why are we in our industry so interested? Of course, I am sure it goes without saying that we all recognize that the savings of a lot of people are invested in the public utility industry in Pennsylvania. The Federal Power Commission's recent report indicates that the investment of the major utilities in Pennsylvania amounts to $1,156,000,000 or 8.3 per cent of the comparable investment of the United States. Many of the individual investors depend upon their income from these savings for their livelihood. We are the guardians of this trust. If every one lost heart, a large part of this investment would become useless. An industrial sales manager has

truly said, "Show me an industrial customer who is not putting in new equipment, who is not changing his processes and his product, and I'll show you a customer we are going to lose." On the other hand, where individual enterprise continues, the investment is continually useful and the investors continue to obtain their wages.

We are further interested because we are restricted in our market area. If a large majority of people lose heart we cannot go to some other part of the country to serve areas where the individuals are more enterprising. Our customers and ourselves must continue our initiative.

Certainly we are interested; and in addition, don't we have all it needs to do our creative part in all Pennsylvania communities?

To do our part we need the confidence of the public. Although our industry has been through the same thing the railroads suffered in 1912, it has not been found wanting, and we do have the confidence of the public.

For our industry to be helpful, its individuals must be helpful. In this respect we are certainly well equipped because representatives of our companies are parts of and in many cases are leaders of the communities of Pennsylvania. Throughout the state, the electrical industry's representatives have been good enough to lead hospital drives, community fund drives and other similar community projects. They are surely good enough to be leaders on the positive creative side of encouraging individual enterprise so that their communities may prosper.

These representatives of ours are a continuous part of everyday life in every community. Their field covers domestic life, commercial life and industrial life—and in addition, they are to be found generally helpful in both the charitable and social life of the communities. They know other men of initiative who are familiar with not only the local problems but the outstanding local advantages.

These men of our industry are trained continuously to be creative new business men, and they have many experienced specialty men fully supporting them.

Then again, our industry nationally, is equipped with a group of men amounting to almost 2000 competent industrial engineers, who, through their daily personal contacts and helpfulness in industrial plants, have an entree second to none in the industrial life of America.

Then, finally, these men of our electrical industry are a part of an industry which no one can say has held back in its investments through fear of the future. Our electrical industry does not give lip service to the spirit of individual enterprise, for our estimated investments in Pennsylvania for 1939 alone is the challenging total of $29,870,000. Certainly, our industry is still enterprising.

Gentlemen, our industry is not only vitally interested, but we are equipped to be helpful to the spirit and action of those men who are creating jobs and making money.

What can we do about it to assure those who are losing heart? What can we do to keep every one keenly alert to the opportunities around him? What can we do to give the 20,000,000 young men and women of employment age since 1930 the certainty of a prosperous future?

Should the Pennsylvania Electric Association organize to carry on education on behalf of individual enterprise? Should "individual enterprise associates" be formed in each community? We might ask ourselves many such questions. With all the natural advantages we have in Pennsylvania and the active national advertising campaign of Governor James' new State Department of Commerce, we should certainly fully cooperate with this new activity that may bring Pennsylvania far ahead in its industrial production and individual prosperity. Mr. Mark James, Deputy Secretary of the Department of Commerce, says that the electrical utilities *now* have a very excellent opportunity of helping themselves and their local communities. He suggests active help to the local communities in the preparation of fundamental industrial information requested by the Department of Commerce in order that Pennsylvania and the utilities can create jobs and prosper through bringing national attention to the many industrial advantages of Pennsylvania. After all, the money which is being spent on this national advertising campaign is contributed by every one of us, and we should take full advantage of all money that is spent.

We should undoubtedly help the activity known as "Junior Achievement, Inc.," which offers so much encouragement for young men and boys who have been unable to find work and who are anxious to make themselves useful in their community now and later.

I offer no formal plan, however, but if you will grant that individual enterprise has made and is continuing to make America, and that many people are still creating jobs and making money and have not lost heart; if you will grant that our industry is magnificently equipped to be community leaders; if I have been able to inspire a few of you on the creative side and you will go home and inspire a few more, the Pennsylvania electrical industry will be the leaders in creating jobs and making money.

For it is as true today as it was when Emerson said:

"An Institution is the Lengthened Shadow of One Man."

Proceedings of CIGRE to Be Available

Bound volumes of the complete proceedings, of the 10th International Conference on High Tension Electric Systems (CIGRE) held at Paris, France, June 29-July 8, 1939, inclusive, will be available at the end of this year in French, and if there is sufficient advance demand in English, according to Colonel Frederick Attwood, president, American National Committee, CIGRE. The proceedings include technical papers, detailed discussions and committee reports.

Those desiring the proceedings should address their requirements to Mr. Tribot Laspiere, general secretary, Conference Internationale des Grands Reseaux Electriques, 54, Avenue Marceau, Paris, France. Subscriptions to these bound proceedings are requested as promptly as possible and special discounts will apply to the purchase price if subscriptions are received before Oct. 1.

RECENT PUBLICATIONS

A-C Network Operation, 1936-1937

Pub G1—A report of the Transmission and Distribution Committee, 48 pp. Price: 80¢ to members; $2.00 to non-members; $2.10 foreign. Edison Electric Institute, 420 Lexington Ave., New York, N. Y.

Sixty-nine companies operating 222 network areas in 121 cities or localities have submitted data which have been compiled and tabulated in this report for the period 1936-1937. These data have been analyzed, in general, on two bases, i.e., in relation to per cent of total peak load and per cent of reporting localities.

The total peak load served by low voltage a-c networks in 1937 showed an increase of 37.6 per cent over that reported for 1935. The total reported installed transformer capacity showed an increase of 27.4 per cent for the same period, which results in a continuation of the improvement in load-transformer capacity ratio.

The allowable voltage variation at

(*Continued on page* 449)

PRIZES AND AWARDS

to be administered by the

EDISON ELECTRIC INSTITUTE

and awarded in 1940

Prizes to Individuals

For Papers on Subjects Relating to the Electric Light and Power Industry

FORBES PRIZE . . . . . *Public Relations*

A cash award of $250 donated by Mr. B. C. Forbes, Editor, Forbes Magazine, for the most meritorious paper dealing with the subject of Public Relations in the Electric Light and Power Industry.

McGRAW PRIZE . . . . . *Engineering*

Cash prizes of $250, $150 and $100 donated by Mr. James H. McGraw, Honorary Chairman, McGraw-Hill Publishing Company, for the three most meritorious papers on any Engineering or Technical subject relating to the Electric Light and Power Industry.

RULES AND CONDITIONS OF CONTESTS FOR ABOVE PRIZES TO INDIVIDUALS

Any person employed by an electric light and power company is eligible to enter the competition. No person is eligible to win two years in succession the identical prize or lower prize of the same award, but is eligible for a higher prize of that award. Papers must be the original work of the author or authors, prepared exclusively for this competition. Papers may be of any length, and pen-and-ink drawings or photographs suitable for reproduction may be included. Papers should be typewritten on one side only.

The first page of the manuscript must give the following information: the name of the prize for which the paper is submitted, title of paper, name of author, name and address of employing company, title or character of position and home address. One paper may not be submitted for more than one prize.

Papers not receiving awards will, upon request, be returned to contestants after the awards have been announced at the 1940 Convention of the Institute. Prize winning papers will be available for inspection at the general offices of the Institute.

Papers for above prizes must be forwarded, in duplicate, by March 1, 1940

Awards to Individuals

For Accomplishments or Acts as Specified

THE R. B. MARSHALL AWARD . . . . . *Electric Ranges*

A cash award of $500, divided into five equal parts of $100 each for utility representatives who sell, lease or rent during the calendar year 1939 the greatest number of individual domestic electric ranges of a rated capacity of seven kilowatts or more.

salesmen.

CLAUDE L. MATTHEWS AWARDS . . . . . *For Valor*

A cash award of $500, divided into five equal parts of $100 each for utility representatives who sell, lease or rent during the calendar year 1939 the greatest number of individual domestic electric ranges of a rated capacity of seven kilowatts or more.

salesmen.

CLAUDE L. MATTHEWS AWARDS . . . . . *For Valor*

For acts of devotion to duty wherein extraordinary courage has been exercised in efforts to maintain important electric service or to restore service in the shortest possible time.

Three cash awards each of $150 are offered for the calendar year 1939 by Mr. Claude L. Matthews, Vice President, W. N. Matthews Corporation, to the individuals selected on the basis of evidence submitted, as being most entitled to the awards. A citation and an appropriate button or pin will accompany each cash award.

Recommendation for the award must be submitted by the President or acting executive head of the company in which the person recommended is or was employed. All recommendations for the year 1939 must be forwarded to the Secretary of the Edison Electric Institute not later than *March 1, 1940*. It is urged that a recommendation for the valor award be submitted as soon as convenient after the occurrence of the act of valor.

Statements substantiating entries for above awards must be forwarded, in duplicate, by March 1, 1940

Complete details concerning the two above awards should be secured from the Secretary, Edison Electric Institute, 420 Lexington Ave., New York, N. Y.

Awards to Companies and Individuals

For Accomplishments in Specified Activities

CHARLES A. COFFIN AWARD

Sponsored by the General Electric Company

A Gold Medal, known as the Charles A. Coffin Medal, will be awarded for the year 1939 to the public utility operating company, within the United States, which has achieved the greatest advancement in its operations and physical plant, thereby making a distinguished contribution to the development of electric light and power for the convenience of the public and the benefit of the industry. The company awarded the medal will also receive $1,000 for its employes' benefit or similar fund.

GEORGE A. HUGHES AWARD

Domestic Electric Cookery Load

Three prizes donated by Mr. George A. Hughes, President, Edison General Electric Appliance Company, Inc., consisting of trophy or certificates to the public utility operating companies within the United States which, during the year 1939, have made the most distinguished contribution to the development of the market for electric ranges through promotion or selling, or both, directly or cooperatively, or both, and cash prizes totaling $1,000 to the individuals responsible for the achievement. First prize—to the company—a trophy; to the individual or individuals responsible—$500; Second prize—to the company—a certificate of recognition; to the individual or individuals responsible—$300; and Third prize—to the company—a certificate of recognition; to the individual or individuals responsible—$200.

AUGUSTUS D. CURTIS AWARD

Lighting of Buildings

A certificate donated by Messrs. Darwin Curtis and Kenneth Curtis, of Curtis Lighting, Incorporated, in memory of Augustus D. Curtis, to the public utility operating company within the United States which, during the twelve month period ending March 1, 1940, has shown the greatest contribution to the advancement of Artificial Illumination of interiors or exteriors of Commercial and Public Buildings, and a cash prize of $300 to the individual or individuals in that company responsible for the achievement. A second prize of $200 and a third prize of $100 to the individual or individuals responsible for the achievement of the companies adjudged second and third in the contest.

THOMAS W. MARTIN AWARD

Rural Electrification

A bronze plaque donated by Mr. Thomas W. Martin, President, Alabama Power Company, to the public utility operating company within the United States which, during the year 1939, has shown the greatest contribution to the advancement of Rural Electrification-Agricultural advancement within the company's territory due to uses of electricity, development of rural load, cooperation with other agencies, extension of rural lines, organization and plan for conducting rural electric development.

Presentations of accomplishments must be forwarded by April 1, 1940

IMPORTANT—Complete details for the Charles A. Coffin Award, the Augustus D. Curtis Award, the George A. Hughes Award, and the Thomas W. Martin Award should be secured from the Secretary, Edison Electric Institute, 420 Lexington Avenue, New York, N. Y. Elaborate and costly exhibits are unnecessary. The merit of the enterprise presented in papers or exhibits will be the prime factor in determining awards, without regard to the size of competing companies.

Papers and Exhibits for 1940 prizes should be addressed to the Secretary, Edison Electric Institute, 420 Lexington Avenue, New York, N. Y. Winners will be announced and prizes awarded at the 1940 Convention of the Edison Electric Institute

PRIZE AWARDS COMMITTEE: Charles W. Kellogg, James E. Davidson, H. P. Liversidge, *Chairman*, Lewis B. Beatty, *Secretary*

Water Heating Sales Promotion of Idaho Power Company

THE Idaho Power Company has actively promoted electric water heating sales since 1928. Prior to that time the company had a maximum of 4500 water heating customers. Most of them were served on a flat monthly rate, paying $2.25 per kw of heater capacity.

With the advent of metered rates the number of water heating customers decreased until in the spring of 1928 we had only 2550 customers. The water heater installation at that time was a locally built-up job. It consisted of a fibre covering or jacket which was placed around the regular water boiler and heaters which were inserted into the tank and controlled either manually or with thermostats. This type of heater was sold until 1933, when the factory-built job was available. Owing to depressed business conditions, we were unable to sell more than three or four hundred electric water heaters a year for the first two years, but by 1935, through the combined efforts of company and dealers, we were able to sell 3.21 per cent of our customers water heaters; in 1936, 6.06 per cent; in 1937, 5.07 per cent, and last year, 1938, 4.34 per cent.

Our company serves a thinly populated area in southern Idaho and eastern Oregon. The territory is 450 miles long with long stretches of sagebrush desert separating the irrigated sections where our customers live. Our load building methods have been adapted to this type of territory. Since our property averages only 13 customers per mile of distribution line, we use the "all service" type of salesman. That is, each salesman sells all types of domestic and farm service, and we do not have lighting or cooking or water heating specialists. Company salesmen have about 1600 customers in each territory and during the last three years have averaged from 40 to 70 heater sales per year.

An active sales training program is conducted throughout the year. The residential sales manager prepares and assembles the sales training material. He also presents this material to the operating divisions and periodically supervises their training classes. Sales presentations are developed by individual salesmen and rehearsed, using other salesmen as the customers. Sound recordings are made and played back so that each salesman can be his own critic. This gives the salesman the opportunity to hear himself as others hear him. The better records are used in training other salesmen who have not developed a satisfactory water heating presentation. The value and use of automatic electric hot water service are the principal feature of the sales presentation. Training for the product features are obtained from manufacturers, sound slide films, visualizers and other sales training aids.

Water heaters are sold at an installed price which gives about 35 per cent margin of profit on the water heater. The company has practically all water heaters sold in the territory installed by recognized plumbers and wiremen. We make a flat charge to the dealer for the installation so that he can sell a heater as a packaged article and not be bothered with the details of installation. This charge amounts to about 30 per cent of our cost if the electric heater is the sole source of hot water in the residence and about 60 per cent if it is installed to be used in conjunction with some other source such as furnace coil or laundry stove. In this way we have control of the installation and can be sure that it is properly made.

During 1938 more than 64 per cent of our water heater sales were straight electric installations. In our opinion, it is a very important item in any successful water heating program. The average cost of installation including wiring, plumbing and pipe covering is about $26.00. The amount varies slightly in various parts of our system.

Special emphasis is placed on water heater sales by means of campaigns, special prizes and commissions. All sales employees are drafted into these special activities, as well as the efforts of other employees. Quotas are set and every effort exerted to reach and exceed them. Dealer sales of water heaters count the same as company sales toward quotas, and dealers are urged to tie in with these campaigns.

Idaho Power Company starts its water heater sales activities at the first of Arpil because furnace use decreases then and the public in general is thinking about other means of heating water through the summer months. It has been found that an intensive spring campaign produces results that extend throughout the balance of the year. Sales record of the past three years indicates that electric water heaters can be sold during the fall and early winter months almost as easily as during the spring and summer.

Intensive advertising of electric water heater uses has played a major part in the sales the company has created. All media are used—newspapers, radio, posters, direct mail and window display—for this purpose. The most effective type of direct mail advertising used has been promotional blotters mailed to residential and farm customers.

Home service advisers are trained to sell the advantages of electric water heating at the time of each customer contact. Cooking schools emphasize the value of water heating by electricity, and a kitchen coach is used to display electric water heating equipment to farm customers.

Company salesmen are paid commissions on water heater sales by dealers in those instances where the salesmen have given the customer a sales presentation on water heating within thirty days prior to the sale by the dealer.

The Electrical Equipment Sales Association, an association comprised of electrical dealers and the utility, advertises no particular make of heater, but does intensive advertising of the advantages of electric water heating service. This advertising is tied in with product advertising by the various dealers. This presents the story of water heating, also tells the customer where he may buy and the particular advantages of different makes of water heaters.

Domestic water heating customers are served on a single meter rate. Those having approved water heating installations are given a half cent discount on a certain block of kilowatt hours after 200 kwhr have been used. This discount gives the customer normal water heating service at one cent per kilowatt hour. The size of this discount block varies from 200 kwhr for a 12 gallon heater up to 800 kwhr for 70 gallon or larger. The rate schedule gives the company the privilege of limiting the hours of service to 18 hours per day. One carrier current installation is used for controlling the hours of service. This has proved to be very satisfactory and will be extended

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Georgia Power Company's Information Program for Employees

By James M. Stafford, Jr.
Georgia Power Company

From the Harvard Business School Alumni Bulletin

"Means should be adopted for taking the Company's men into the Company's confidence. They should be informed concerning the Company, not only its policies and purposes and motives, but particularly its plans and its constructive undertakings. This information should be given them before it is given the public. If it can't be done in person, it must be done in bulletins or a Company publication. In meeting the public, every employee, no matter how humble his station, should feel, if possible, that he has inside information about the business. He should understand that his work has its part in the ultimate result, and his duties should be interpreted to him in the aims and accomplishments of the enterprise as a whole." *P. S. Arkwright, president, Georgia Power Company.*

THE above statement might well have been made within the past two years, since the inauguration of the Employee Information Program of the Georgia Power Company. Actually, it is an excerpt from a speech delivered by Mr. Arkwright in October, 1921. It is quoted here for a twofold reason; first, because it is indicative of the fact that for a great many years this Company's management have looked upon good *employee* relations and understanding as the first step toward good *public* relations and understanding; second, the statement established the major theme upon which the present Employee Program of the Company was launched on September 1, 1937.

Through more or less frequent meetings of one kind and another and a carefully edited monthly publication, employees have been informed, during past years, of Company plans, policies and problems. Through consistent paid advertising, the Company has endeavored to inform its customers regarding the advantages of electric service and matters affecting both the Company and its customers. But, in recent years—together with other public utilities and American business in general—the management have realized the need for even greater and more painstaking consideration of the importance of the well informed employee in building and maintaining better customer relations. Businesses in large number have arrived at what may have been the sudden, even if obvious, conclusion that one approach to the matter of obtaining public understanding of the operations and problems of a business is to get the *employees* of the business to understand them. This latter conclusion was responsible, at least in part, for organization of the Employee Information Program of the Georgia Power Company.

Following approximately a year's careful study and planning, the Employee Program was announced to the 5,000 employees early in September of last year. Too many plans and purposes and rules and regulations for conduct of the program were not laid down, for the very simple reason that judgment and intent dictated that the program and all its allied activities should be an employee, rather than a "head office," program. Furthermore, employee participation in the program was placed upon a purely voluntary basis, with the conviction that employees would get more out of the activity if they entered into it because they *wanted* to do so. Those responsible for operation of the program can say emphatically that it has become, more and more, an *employee* activity and that the voluntary aspect of it has made it an ever developing, an ever widening influence for good throughout the Company.

The original prospectus for the Employee Information Program listed the following general purposes:

1. To give information regarding the Company and its problems, in order to take the employee more fully into the confidence of the management and to build up pride in the employee for his position in the operation of the business;
2. To create better relations between employees and departments within the Company—not alone for the welfare of the Company but also for the greater personal advancement and satisfaction of the individual employee;
3. To invite employees to assist in formulating Company policies;
4. To provide a routine by which employees may offer criticisms and suggestions regarding Company operations and customer relations;
5. To offer training to employees in informal public speaking;
6. To supply facts regarding American business and economics; to encourage study of Georgia history and resources;
7. To promote greater interest of employees in public affairs — social, business and political.

Although a great many suggestions are originated by and exchanged through the Atlanta headquarters, the Employee Program functions within each of the Company's six geographical divisions in the state. The *division manager* is charged with responsibility for all phases of the Company's business within his division—operations, sales, accounting, stores, and he is as well responsible for the Employee Program activities in his division.

Working closely with each of the division managers is a *division sponsor* ——an employee, who gives only part of his time to the activity but, who reports to the division manager on all matters affecting promotion of the program. Two of the division sponsors are division claim agents, one is a steam heat salesman (Atlanta), one is an assistant division auditor, one is a division lighting engineer, and another is a division transmission engineer. These men were chosen for the employee work because of their demonstrated abilities in leadership.

Each division has a *division committee* for the program which is made up of the division department heads—operating superintendent, auditor, sales supervisor, storekeeper—the division manager and the division sponsor. The division committee meets regularly and serves as the "general policy committee" on matters affecting all employee activities.

The key people in the entire Employee Program are those who serve as *group leaders*. Of course, the number of group leaders in each division varies with the number of employees in each division, but the total number runs to approxi-

mately 200. Each group leader conducts regular meetings of employee groups ranging in size from eight or ten to as many as 20, 30, or 40. The group leaders, some of whom are women, were chosen among other reasons for their abilities in leadership. Their occupations range from line foremen and bookkeepers to department heads.

In launching the Information Program it was believed that the group leaders would constitute the main cog in the wheel, that upon them and their work would depend the ultimate and continuing success of the program. And at this time there is every reason to credit these employee-leaders with whatever success has been attained in various phases of the plan. By reason of their interest in the program, many group leaders have obtained recognition for themselves which they might not otherwise have received. In fact, for many of them, it presented the very first opportunity to show that they were capable of doing things other than stringing wires, erecting poles, keeping books, selling appliances, operating buses, or working over drawing boards. A great deal of attention has been given to the training of group leaders since the program began, and still more attention will be given it in the future.

The *general committee* at Company headquarters in Atlanta is made up of the president of the Company, the vice-president and general manager, the vice-president in charge of sales, the assistant to the president, and the manager of the Advertising department. (As well, each of the six division managers is a member of the general committee.) The purpose of this committee is to draw together general department heads of the Company to set out and to discuss certain necessary policies and procedures concerning the Employee Program. Responsibility for promoting and conducting the activity is lodged with the Advertising department, and two members of that department represent the general committee in field contacts with division managers, sponsors and group leaders. These men are responsible for preparation of bulletins for group leaders and sponsors, for keeping records regarding activities of the program, and for rendering other obvious assistance of a general character. Still another member of the Advertising department prepares information folders for discussion in employee meetings, subject to approval of the general committee.

Under the plan of operation for the Employee Program, employee groups meet twice a month for one hour. Although all meetings are held on Company time, attendance is entirely voluntary, as is, of course, participation in any parallel activity of the program. Records indicate that at least 75 per cent of the 5,000 employees are active members of various groups.

Subject matter for discussion in the employee meetings is supplied through the regular publication and distribution of information folders prepared at Company headquarters in Atlanta. Among the subjects which have been discussed throughout the Company are taxes, electric rate structure and application, the American business system, Georgia's resources, the Company's financial condition, salesmanship, citizenship, electric meters, political accusations against the Company, the Company's rate valuation and tax valuation, Safety—the cost of accidents to everyone concerned, the prevention of accidents in the home and office, first aid, health protection, automotive safety.

A meeting of the group leaders in each division is held in the early part of each month for the purpose of preparing the leaders for conducting their employee group meetings held later in the month. At the group leader meetings every effort is made to build up a "model presentation" of the subject at hand, in order that the group leaders may receive suggestions as to complete and effective methods for placing the particular subject before their individual groups. In addition to discussions of subject matter contained in the information folders, parallel information regarding the subject is presented. For example, in the study of electric meters the Company's meter superintendent attended each group leader meeting and not only gave a thorough talk on the subject, but answered dozens of questions that cleared up misunderstandings of meter testing, meter reading, billing and other phases. Guest speakers from outside the Company appear frequently on the group leader program. Fundamentals of public speaking, memory training, the public's attitude toward utility employees, Georgia agriculture and manufacturing have been among the subjects discussed by the guest speakers.

A group leader meeting may last from one and a half to two hours—all, of course, on Company time—depending upon the type of program the division sponsor has built and the interest of the group leaders. When planning his program, each sponsor proceeds on the theory that the more group leaders he can have appear on the program the better, and this theory is carried by the group leader into his employee group meeting. It is believed that, almost without exception, group leaders look forward to their meetings with other group leaders as highlight occasions of each month.

What have been the results obtained thus far from the Employee Program? Has it been worth the time and expense it has required? Perhaps the following statements may answer these questions for the reader.

Employees of the Georgia Power Company generally now speak more intelligently and confidently to their friends and customers regarding the Company's rates and services, its policies and problems. Prior to the Employee Program, some employees say that they dreaded having their friends ask them about the Company's operations. Now there seems to be a *desire* on the part of employees to discuss the Company with their friends, because they have been equipped with interesting and adequate information about the Company.

Employees have welcomed the frankness with which the Company's financial problems have been placed before them. Having been taken more into the confidence of the management, they now feel themselves more definitely to be an integral part of the Company.

There has been fine improvement in relations between departments inside the Company. In some locations the Employee Program has developed a fraternal spirit such as was not evident a year and a half ago. In the smaller towns, fish fries, barbecues, dances and family parties have been held on several occasions in combination with the employee group meetings. These social affairs were arranged by the employees on their own initiative and paid for by them, not the Company, because the employees wanted it that way.

One direct measure of the improvement in customer relations is the reduction in complaints. One district manager reported recently that the number of complaints now coming across his desk is fully 80 per cent less than a year ago. He says that individual employees now take it upon themselves to straighten

out the majority of complaints. Heretofore, employees were inclined to say "Well, you'll have to take that up with the district manager." Now they sit right down, then and there, and do their best to satisfy the customer's complaint.

A few months ago—under the sponsorship of the Employee Program—a questionnaire was mailed to each employee requesting the following information: "What three general complaints or criticisms regarding the Company's rates, services or policies do you hear most frequently from customers of the Company?" About 1000 answers were sent in, listing 14 different types of complaints and criticisms. As a result, various causes of complaint were corrected and the employees obtained valuable experience in studying the causes of customer dissatisfaction. Another employee questionnaire is being prepared at this time. It will request employees to give their views on matters of Company policy, their criticisms of Company operations, working conditions and other pertinent matters, including their criticisms of the Employee Program itself.

One of the most interesting phases of the employee activity has been in the direction of training for public speaking. Last fall and winter, employees in Atlanta organized two classes in public speaking, hired their own instructors, and paid the instructors out of their own pockets. One of the classes met at eight o'clock on Saturday mornings, although Saturday is a holiday under our five-day week. Other employees have gained training and experience by taking active part in their group meetings. They have learned to speak well by getting up and speaking.

On their own initiative, groups of employees in Atlanta have organized "forums." Meeting on their own time, they have discussed such subjects as the Constitution of the United States, municipal affairs in Atlanta, the wages and hours law, parlimentary law, territorial possessions of the United States, and other subjects of varying interest. It goes without saying that these forum meetings offer many opportunities for employees to speak, to learn, and to know their fellow employees better.

In the spring of last year attention was given to study of the American business system. The Employee Program played a prominent part in Georgia's participation in the "What Helps Business Helps You" campaign of the United States Chamber of Commerce. Dozens of employees were invited to speak before civic organizations on this subject, and they are still being called upon. The instruction and practice which group leaders and other employees have received has developed a corps of employee-speakers who can stand on their feet and speak persuasively about matters concerning the Company and other matters of public interest.

Another indication that the Employee Program has developed a cohesive, effective organization, was its success in sponsoring an all-employee sales campaign during the summer months, when approximately $75,000 in small electric appliances were sold, against a quota of $50,000. In that sale, more different employees sold appliances than in any previous all-employee sale in the Company's history.

An important outgrowth of the Employee Program was the recent organization of an Executives' Program, in which 100 executives of the Company at general headquarters in Atlanta have been formed into two groups for regular monthly meetings. The leader of one group is the vice-president and general manager; the other is the vice-president in charge of sales. Vice-chairman of the two groups are the treasurer of the Company and the secretary. At their meetings the executives discuss the same information material as the employee groups, as well as other matters of general interest.

Prior to organization of the executive groups, there were no facilities for such regular meetings of "top men" in the Company. It was not uncommon for some executives not to see others for weeks on end, although working in the same building. It can be said with emphasis that the *social* aspect of the executive meetings alone has reduced inter-departmental frictions and developed greater consideration and appreciation of one department for the other. In addition, the executives have given new life to the entire program by their interest in their own meetings and by encouraging members of their departments to participate actively in employee group work.

The Employee Program is not a perfect program nor is it presented here even as a rough pattern by which any other utility may wish to proceed. But it has done, and is doing, a good job. The management of the Georgia Power Company have great hopes for its future and for the good effect it may continue to have upon employees, upon relations with customers, and upon the Company's welfare as a whole. Begun as an experiment, it has already demonstrated its worth and has shown that it offers broad possibilities for constructive help in every phase of the Company's activities.

Transmission and Distribution Committee Program

(*Continued from page* 443)

customers' services, when compared either on a total peak load basis or the total number of localities, indicates that either 73.1 per cent or 58.7 per cent, respectively, are operated at plus or minus 3 to 3.5 per cent allowable voltage variation. The trend toward this objective voltage range is contrary to that experienced as reported in the 1935 Report.

The performance of net work protectors under fault conditions requiring the clearing of defective primary equipment at the secondary side of the network transformer has improved 25.2 per cent over the record for the previous report. Excluding those failures not directly chargeable to the protector, this failure record is the best known in any of the preceding seven years.

Assuming the present secondary major fault record or rate to be typical, the expectancy or rate of occurrence of major faults on the secondary grid is approximately one major fault per 100 miles of equivalent to 3/ϕ and neutral secondary cable every two years. At the present failure rate for equivalent three-phase network transformer banks, the expectancy rate for failures is approximately one failure in each 100 equivalent three-phase transformer banks every two years. Approximately 93 per cent of all complete network outages for the last seven years are occasioned by failure of the source of power to the network primary feeders.

The conclusions reached and the tabulated data presented in this report should be accepted with the realization that it is extremely difficult to select a method whereby the trends could be presented where the data of a large number of small units would not overshadow the performance of a small number of large units. Conversely, when compared on a basis of size, the reverse condition would be true. Realizing that a weighting factor would be greatly influenced by individual opinions and experience, the conclusions reached in the report may not necessarily present a correct picture when a comparison to an individual network is made.

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Basic Elements and Results of Buffalo-Niagara's Better Light—Better Sight Program

By Howard M. Sharp

Manager of Lighting Bureau, Buffalo, Niagara & Eastern Power Corp., Buffalo, N. Y.

Paper Presented at the National Lighting Sales Conference, held in Conjunction with the 33rd Annual Convention of the Illuminating Engineering Society, San Francisco, Calif., August 24-25, 1939

IN view of the fact that home lighting is the newest large scale lighting application activity, the methods adopted and the practices followed are far from standardized. Therefore, the exchange of experience data, which to more practiced lighting executives in other fields may seem elementary, is a welcome part of any series of discussions dealing with lighting practice.

In 1932, in the Utica property of our company the initial field experiments were carried on, out of which grew the methods of educational selling now considered quite generally as the backbone of any approach to the home lighting market. It is fortuitous that in this discussion, I am able to indicate the continued interest of our company in home lighting, and to outline some of the basic elements of our operation. I am quite aware of the diverse ways in which the problem has been approached, of the differences in utility policies which have dictated personnel, organization and method. The purpose of this discussion is not to imply that our way of operation is the best, that what we have accomplished is superior; rather, this is in the interest of free and open interchange of ideas, out of which each of us in the industry may find an answer to some problem, an idea as to a new method, or to the still skeptical, furnish additional evidence that this activity is worthwhile. In the four years of operation, we have proven some ideas, discarded others, discovered new ones. I shall discuss them topically and frankly with no attempt at continuity, in the form of experience data with which each reader may do as he or she chooses.

Organization

In round numbers the distribution of residential meters in our territory is 186,000 in urban areas, 45,000 in small communities and 18,000 on farms. They are served by eight major districts, each maintaining a fairly complete operating and sales staff. The equivalent of 27 full time girls and three supervisors are now employed. Basically our company believes in a functional rather than a market sales organization, with modifications based upon local conditions. Our home lighting staff was put on the specialist basis on the theory that a new field required intensive, single-minded application. We were thus able to choose our advisers for a single specific task in a given area, to train them intensively and supervise them closely. In a paper before this group at Cincinnati in 1935,[1] and another at White Sulphur Springs in 1937,[2] these steps were rather completely outlined.

MR. SHARP

Our experience has dictated but slight changes from the original plan. In the five offices serving the majority of urban customers, the specialist approach is entirely satisfactory. Travel distances are small, concentration of customers is heavy, and the market demands single-minded attention if the job is to be done properly. In three districts involving many rural customers and small scattered communities, we have combined home service and home lighting. We sell only ranges, water heaters and roasters so that it was possible to utilize existing home service personnel more effectively by this method. Lighting quotas are arranged to fluctuate with seasonal appliance effort. If there are two girls in one office, one carries the burden of lighting, the other the burden of home service, but both are trained so as to assist the other during peak periods. Such a combination does reduce transportation, time and expense. On the other hand, supervision must be closer and sympathetic, expert staff service called upon more often and training periods more frequent. The net result has been no discernible reduction in costs, but a more logical use of personnel that seems more businesslike and more satisfying generally. Our experience indicates that if the objectives are kept clearly in mind; if there is a sound knowledge of the fundamentals of lighting application, the organization methods that are adopted are not germane and have little influence on the final results. My own personal views coincide with this conclusion. If a single job is to be done in the best possible way, then there is little question that specialization is required. That applies to lighting when the desire is to do the best possible lighting job regardless of anything else. However, when it may be necessary to do several jobs with a given personnel, some compromise is inevitable. The management's responsibility is heavier under these circumstances because there must be a thorough knowledge of the many factors to be balanced, and constant study and reappraisal of the situation is necessary in order to maintain a well balanced organization. Human be-

[1] "Training for Lighting Sales."
[2] "Utility Lighting Sales."

ings generally like to do only one thing at a time and to do that one thing in a reasonably competent way. All the sales theories and organization charts are not going to change that psychological fact. It must be reckoned with.

Personnel

The initial group of home lighting advisors and supervisors totaled 28. Their qualifications, selection and training were rather completely discussed in the aforementioned Cincinnati Convention paper. The average age of that group was about 27 years, and heavy emphasis was placed upon personality, character and appearance. The moot question was one of turnover. Well, after four years, 15 remain of the original 28, and their experience and competence is a source of much satisfaction. Every department head knows the comfortable feeling that comes of having a few "old timers" who can tackle most anything. The average tenure of job for all girls who have been on our payroll has been 2 years, 5 months. Those now composing the staff average a service of 2 years, 10 months. Those who leave do so for a number of causes, ranging from marriage to incompetence. Our personnel director says that a 75 per cent average in picking successful public contact employees is something to be proud of. Modestly, ours has been above that so far. For the statistical minded, Table I summarizes the facts.

TABLE I

Advisers	*Years of Service*	*Service Record*
15	4	Still in department
5	2½	" " "
3	2	" " "
4	Less than 1 year	" " "
8	2¾ years average	Marriage
5	7½ months average	Left to take other jobs
2	2½ years average	Transferred within company
4	1 1/6 yrs. average	Dismissed
2	1 1/4 yrs. average	Ill health

These statistics do not include the three districts in which home lighting and home service were combined. However, rearrangements of personnel to effect this change are reflected in the above table insofar as it affected the Lighting Bureau.

It is apparent that contrary to expectations, turnover has not been a serious problem. I am inclined to attribute this to a combination of careful selection, good supervision, enlightened personnel relations, high class working conditions, and the fascination of the job. There is no question but that the human side of home lighting gives an advisor a feeling of contributing to better living which offsets the plain hard work that goes with any continuous public contact.

We still feel that a real necessity for work is one of the more important qualifications for employment. Age, *per se*, is not so important, provided it does not mitigate against health, personality, and adaptability. The reactions of the public and the local industry to our advisor group confirm the original standards as set up and we jealously guard that reputation.

Later sections of this paper will deal with certain phases of the operation which of themselves do not deal directly with personnel, but which do have a bearing on the overall relationship between the advisor and the organization.

Doing the Job

Every commercial organization must have a balance between results and expenses. In sales groups results expected are known as quotas, and while our home lighting advisors are largely idea or creative sales girls, we still use the term quota to indicate a goal toward which to work. It is our practice to develop a twofold quota—added watts (or revenue) and number of home demonstrations. We first determine the total kw accomplishment to be recorded during the year. This is increased by a factor of safety of 10% to take care of unexpected illness and personnel replacement and is then apportioned equally among the advisors. Next we modify the individual wattage by conditions in the territory and the capability of the girl. This varies from 110 to 157 kw. We know the average wattage which can be added by each girl from each demonstration. Dividing the individual yearly total of kw by this figure gives the number of demonstrations which on the average will produce the results by the end of the year. This varies from 500 to 700. These figures are then prorated on a monthly basis in accordance with experience as to the influence of weather, vacations, and other seasonal factors influencing home calls.

At this point we have introduced what is to us a new note in what after all seems cut and dried. At the beginning of each month the current monthly quota is revised, depending upon the extent to which the previous month's quota was exceeded or missed. Thus a girl who applied herself diligently in March, for example, and went 10% over expectation, will have her April quota reduced proportionately. On the other hand, failure to make a quota only increases next month's work. Due allowances are made for illness, unusual weather, or conditions which have an adverse effect upon residential solicitation.

This variable quota plan offers an incentive to work intensively for short periods with the expectation of a following period of less pressure. It also provides a variation which lessens the impression of a long monotonous twelve months' pull. We have found that for no assignable reasons there will suddenly come periods when lighting demonstrations come as easily as ice cream at a picnic. At such times the smart advisor crowds her luck to the utmost in order to be ahead when the dull days come. This variable quota plan stimulates action during these "flush" periods.

In common with most utilities, we multiply added wattage by a fixed hours of use and a fixed rate. We use 750 hours, which appears to represent a good average. However, this fixed figure does not offer incentive for emphasis on those high use areas which almost invariably represent points of critical eye use. I favor a system of reporting that records the hours use of each lighting application, because this will encourage the really productive advisor and smoke out those who have been taking the line of least resistance by adding relatively ineffective watts and hiding behind the fixed burning hours. Frankly, we don't have the answer to an equitable use figure for various home lighting applications. That is on the calendar for early attention.

To my mind, one of the most important considerations in any home lighting operating is efficiency in the use of time. The work is essentially high cost, most of it in salaries. One wasted half hour a day in a group of 16 represents a full girl day. A 5% change in number of demonstrations means almost two weeks' work. A fundamental weakness that I have observed in most home lighting op-

erations is a tendency to spend so much time on details as to obscure the main issues. We work at that continually, and I bring it up here as one of the important things we have learned in four years of effort.

It will be noted from Table II that steady progress has been made in what we call "efficiency factors." While in themselves the figures are not large, they become important when multiplied by 36 advisors or 12,000 demonstrations a year. When you consider changes in personnel, and illness, there is more work here than meets the eye. Home Lighting demands all the skill and attention that can be mustered. It is distinctly not a casual job if worthwhile results are to be accomplished.

TABLE II

	(4 mos.)				(To May 31)
	1935	1936	1937	1938	1939
Demonstration per Advisor Day	1.77	1.72	2	2.2	2.36
Additional Watts Recommended per demo....	442	463	500	540	470
Additional Watts Installed per demo.....	163	271	256	266	309

For a long time I have felt that it would be desirable to incorporate in the lighting advisor program some incentive to move lighting merchandise into the homes at a more rapid pace, in order that the homemaker could translate into actuality the recommendations of the advisor. However, I am firmly convinced that an educational approach is necessary to teach the use of lighting equipment after it is once purchased, and to really gain the confidence of the housewife, without which the whole lighting program would fail. A combination of salary and commission seemed to be the answer, but the proportions of salary to commission are all important. We studied the equipment recommendations of our advisors and came to the conclusion that if each were to average $30.00 worth of merchandise sales a week, the effort and attention necessary for such sales would not detract from the educational job we wanted done, nor would such a volume by our company represent encroachment on the dealer. We therefore went into the sale, as a company, of bulbs, I.E.S. portables, portable wall lamps, and adaptors, allowing a commission of 10% on bulb sales and 15% on portable lamps and adaptors. During portable lamp campaigns by the merchandise division each girl gets a 5% override on lamps sold in her territory. To arrive at the base salary we subtracted from the established straight salary what we thought would be the maximum commissions earned and set the base salary at that figure, with the understanding that adjustments would be made in accordance with experience.

The plan has worked surprisingly well. Commissions have ranged from 75c. to $2.00 a week, so we know that undue emphasis is not being placed on equipment sales. However, the incentive is there to be just a trifle more alert because added effort will bring direct and immediate benefit. The advisors who were with us from the beginning and had been trained solely in the service approach were not always at ease. To the newer girls it is part of the training and they experience no difficulty.

From the viewpoint of management, this plan reduces fixed costs, provides an incentive for extra effort, speeds the translation of advice into customer use and instills into the operation that extra zip that comes from direct selling. Because 85 to 90% of their earnings is straight salary, we can maintain the same high standard of personnel and exercise strict supervision, thus maintaining the type of operation we feel is befitting to the company, our customers and the product.

Measuring Results

Because home lighting on a broad scale is relatively new, we are ever on the alert for evidence of tangible benefits. We have learned how to measure the additional watts that come onto the lines of the utility. The sales figures on I.E.S. portables, fixtures, and bulbs are well known nationally although less exactly known locally. But because a lighting device is not automatic but under the control of the user, there is always a feeling of insecurity as to the use which will be made of the additional facilities.

Our method of approaching the problem was to concentrate on determining the load growth due to demonstrations alone, a very necessary type of information in proving the concrete value of this one phase of the work. After four years I believe we have arrived at some basic data which will be of interest.

It must be emphasized that these studies require a long time and a thorough technique. Our first effort began about six months after the initiation of the activity. This consisted of comparing electrical consumption of homes in which demonstrations had been made, with that of adjacent homes which received no call. The answer turned out to be exactly nothing. We now know that sufficient time had not elapsed to allow the added lighting to take effect, and we also know that a brand new effort with green personnel does not immediately begin to affect the lighting habits of a community.

A year and a half later we initiated another study with methods and results described in detail in the paper—"Utility Lighting Sales"—given at White Sulphur Springs. We began with about 2700 accounts, and after eliminating those whose change in living conditions rendered them unsuited for analytical purposes, ended up with about 1700. The average value in kwhr of all demonstrations was determined to be 112. Remember this covered only the first one and one-half years of our work. We continued to follow these customers via the meter book and in Figures 1 to 6 present the continuing story of their electrical consumption due to lighting. Note how yearly consumption increased at a much faster pace than the average for the various groups. We attribute this to the accumulative effect of a rather complete survey, plus educational selling, plus favorable reaction from lighting changes carried out piecemeal. Note also the remarkable rate at which consumers move from one consumption group to another. In the minimum bill group this forcefully demonstrates the results of lighting effort. Summarizing the curves we find that low use customer demonstrations account for an increase of 180 kwhr, medium use 242 kwhr, and high use 280 kwhr. For all groups, the average increase was 230 kwhr. I realize that *all* customers were increasing consumption during this period but that increase includes the lighting portion.

During the period of check, our average annual residential consumption increased 124 kwhr. One-third of this is 40 kwhr which multiplied by an average of 225,000 residential meters represents 9,000,000 kwhr from lighting. If we multiply the total number of demonstrations, 40,000, by the increase of 230 kwhr we arrive at a total of 9,200,000 kwhr from lighting. This may be a coincidence, but I would be inclined to accept this as justification of our investiga-

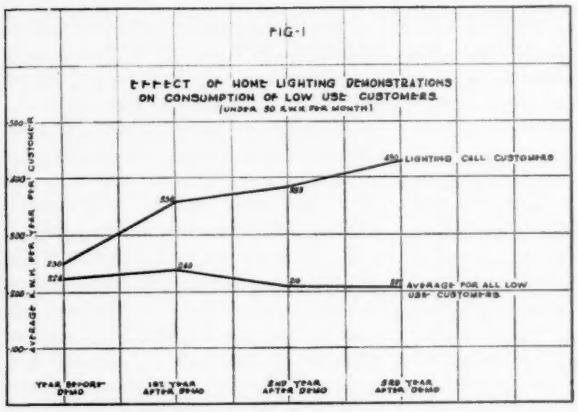


FIG-1
EFFECT OF HOME LIGHTING DEMONSTRATIONS ON CONSUMPTION OF LOW USE CUSTOMERS (UNDER 50 K.W.H. PER MONTH)
AVERAGE K.W.H. PER YEAR PER CUSTOMER
LIGHTING CALL CUSTOMERS
AVERAGE FOR ALL LOW USE CUSTOMERS
YEAR BEFORE DEMO
1ST YEAR AFTER DEMO
2ND YEAR AFTER DEMO
3RD YEAR AFTER DEMO

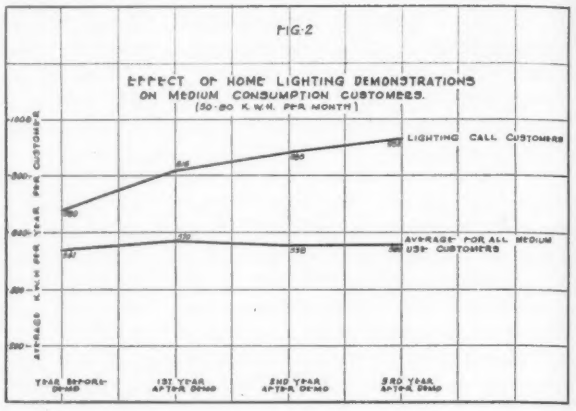


FIG-2
EFFECT OF HOME LIGHTING DEMONSTRATIONS ON MEDIUM CONSUMPTION CUSTOMERS. (50-80 K.W.H. PER MONTH)
AVERAGE K.W.H. PER YEAR PER CUSTOMER
LIGHTING CALL CUSTOMERS
AVERAGE FOR ALL MEDIUM USE CUSTOMERS
YEAR BEFORE DEMO
1ST YEAR AFTER DEMO
2ND YEAR AFTER DEMO
3RD YEAR AFTER DEMO

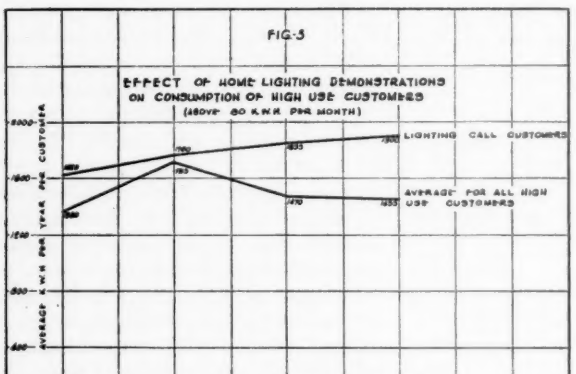
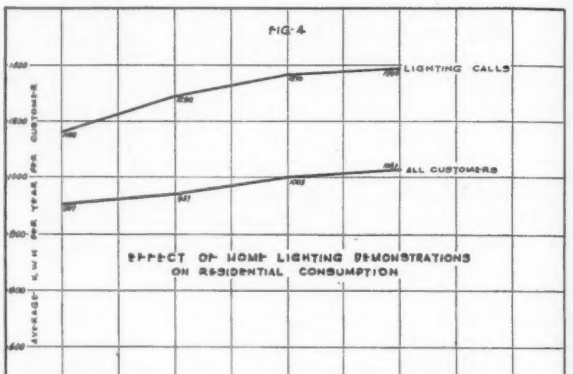


FIG-3
EFFECT OF HOME LIGHTING DEMONSTRATIONS ON CONSUMPTION OF HIGH USE CUSTOMERS (ABOVE 80 K.W.H. PER MONTH)
AVERAGE K.W.H. PER YEAR PER CUSTOMER
LIGHTING CALL CUSTOMERS
AVERAGE FOR ALL HIGH USE CUSTOMERS
YEAR BEFORE DEMO
1ST YEAR AFTER DEMO
2ND YEAR AFTER DEMO
3RD YEAR AFTER DEMO



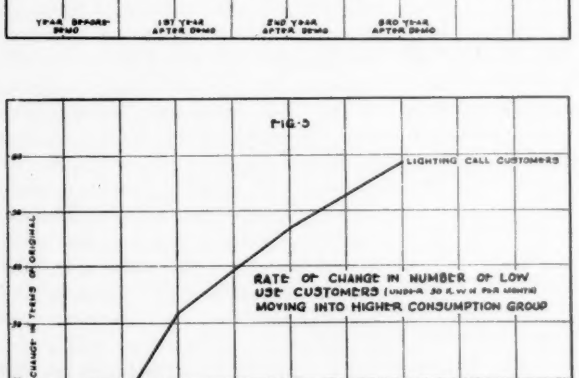


FIG-5
PERCENT CHANGE IN TERMS OF ORIGINAL
LIGHTING CALL CUSTOMERS
RATE OF CHANGE IN NUMBER OF LOW USE CUSTOMERS (UNDER 50 K.W.H. PER MONTH) MOVING INTO HIGHER CONSUMPTION GROUP
AVERAGE ALL LOW USE CUSTOMERS
YEAR OF DEMO
1ST YEAR AFTER DEMO
2ND YEAR AFTER DEMO
3RD YEAR AFTER DEMO

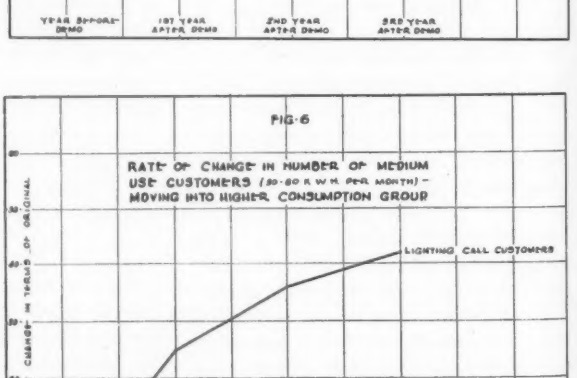


FIG-6
RATE OF CHANGE IN NUMBER OF MEDIUM USE CUSTOMERS (50-80 K.W.H. PER MONTH) - MOVING INTO HIGHER CONSUMPTION GROUP
PERCENT CHANGE IN TERMS OF ORIGINAL
LIGHTING CALL CUSTOMERS
ALL MEDIUM USE CUSTOMERS
YEAR OF DEMO
1ST YEAR AFTER DEMO
2ND YEAR AFTER DEMO
3RD YEAR AFTER DEMO

tion until proven wrong. However, there are so many modifying factors that I would not want to say that the figure of 230 kwhr per demonstration is scientifically exact. What is of importance is the undoubted fact that home lighting builds load, that it builds it at a substantial pace, and that the effects of load addition multiply rather than level out. Furthermore, this study substantiates the acceptability of lighting as a suitable load builder among low use customers.

From our experience, this low use customer promotion should not be enthusiastically endorsed and plans developed solely on the predictions that might be made from a study of this kind. This study shows that *when once sold,* light does build load, but the approach to this market is not easy. A substantial percentage of such customers are on relief; those who are not, live precariously, and credit is slender; they are not reached by the usual appeals we, as utilities, make in our advertising. I believe we need a special brand of sales personnel and advertising, very special equipment, and a type of credit elasticity and terms of payment not now common among utilities. The market must be tested and careful supervision instituted. It can be done but not in the way we deal with average households.

Our experience in digging out this load information has clarified several

(*Continued on page* 464)

Engineering and Power Sales

By Robert O. Babcock
Consolidated Edison Company of New York, Inc.

PRESENT day competition with purchased electric power demands greater knowledge on the part of the utilities of the utilization made of their product.

The logical way to meet competition is to render a superior service. This requires an intimate knowledge of the customers' use of electricity and operating methods in order to determine whether or not electric energy is being used to the best advantage. More than that—it often requires that technical assistance be given to determine wherein the customers' operating methods may be improved.

An intimate knowledge of the customer's method of operation and process often discloses that a proposed electric generating plant will not be suited to his purpose even though it may appear to be of adequate capacity and economically feasible.

An investigation of this nature in the case of an existing plant will sometimes result in proving that it is not operating as economically as the owner may be led to believe.

All of the above determinations might properly be delegated to the utility sales forces. In the last analysis, it is they who are charged with the retention of existing load and customer good-will as well as the acquisition of new business. However, it is almost impossible for them to do this and still do justice to their job of selling and handling the routine business involving the company and the customer.

It has been the experience of the Consolidated Edison System of New York that this situation can best be met by delegating such problems to a group of engineers in the Sales Department who are organized for that particular purpose. Such an organization requires the closest cooperation between the engineers and the power salesmen. It will not do for an engineer to gather together a mass of technical information by way of solving a certain problem and then forward it as just another job completed, as far as he is concerned. It requires instead, a complete understanding of the nature of the problem by the salesman and an equal understanding of the customer's

MR. BABCOCK

entire problem on the part of the engineer. Not just a certain phase of it. The engineer must then proceed to solve that problem, promptly and thoroughly.

The best way to amplify the principles mentioned so far, is to cite a few actual cases where they were applied. The first two of the three cases that follow serve to indicate in general the practice that is usually followed at the present time. The third case is not general practice and is a test case tried by the writer to see whether or not the same principles could be used successfully in the type of case under consideration.

Practical Versus Theoretical Savings

A certain factory makes rubber dolls and novelties. The owner had complained of high power costs to the salesman.

The main power load consists of two 100 horsepower and one 50 horsepower rubber mills, all electrically driven. These are used for breaking down and compounding the crude rubber. The billing is based on hours' use of the maximum demand. One method of solving this problem is to survey the premises and see if some economy is possible in the use of electricity. Let us see how this works out.

An analysis of the customer's load curve indicates very sharp peaks as shown in Fig. 1. If these peaks can be reduced they will save over $2,100.00 per year or over 20 per cent of the total power bill. This seems like a logical answer and might be forwarded to the salesman as the solution to the customer's problem.

Such a saving is certainly very desirable if it can be had. The catch is that it can't. The rubber mills would have to be operated when the rest of the plant was shut down. A night shift would be required and this would result in higher labor and supervision costs. Also, there is insufficient storage space for the output of the mills even if the compounded rubber could be stored for a few hours without complications arising therefrom. Most important of all, the plant is located adjacent to residences and operation after midnight is not permitted because of the noise.

Showing this customer how he can reduce his power costs by improving his load factor is like showing a small boy a large apple pie with plenty of cinnamon and sugar on it—and then telling him to try and get it.

Engineers as a class are all too prone to submerge themselves in the technical aspects of a problem and sometimes lose sight of the fact that the technical solution is only the means to an end. Good business judgment and "horse-sense" play an important part in solving utility customer problems and this must be constantly kept in mind.

Further study of the customer's factory showed some interesting results.

The press rooms and the stamping room were located on different floors and this resulted in a great deal of transporting and handling. If the press rooms were combined and interchanged with the storage room it would assist toward straight-line production. Instead of throwing the rubber stampings into boxes and hauling them by hand to the next operation on a different floor, they could be dropped onto a conveyor belt. Successive operations could be located along this conveyor.

The press room had a very low ceiling and was poorly ventilated. This along with the heat loss from the presses, resulted in bad working conditions.

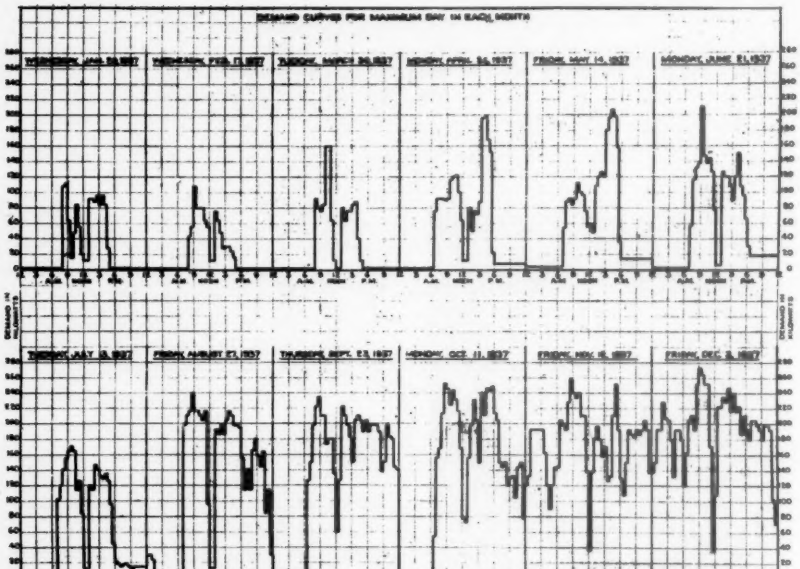


Fig. 1

The room was so hot that the workmen had to quit and go outside occasionally to cool off.

Most of the presses were uninsulated. The cost of insulating them was estimated at $900.00. This would result in an annual fuel saving of $300.00 per year. No estimate was made of the savings in recovered lost time and improved working conditions.

The dies for the molded rubber goods allowed some of the excess stock to spread out between the molds in a thin flash. This flash was trimmed off by hand at a labor cost in excess of $2,000.00 per year. This could be eliminated by redesigning the dies so that there was a knife edge around the molds. This has been done successfully by other companies and there was no patent on the idea. It would not be economically feasible to scrap the existing dies immediately but the knife edge feature could be added when new ones were made. The trimming labor could gradually be eliminated in this way.

Steam for the presses was generated in a hand-fired coal boiler burning soft coal. If the grates were changed and a blower was installed, screenings could be burned at an annual reduction in fuel cost of $1,500.00. This could be further improved upon by either adding an automatic stoker or installing oil burners.

Other improvements were suggested such as lighting, adequate wiring, etc. The point is, this customer could save more by improving his factory operations than by attempting to cut down on his power usage. In fact such improvements in the way of added ventilation, material conveying, boiler room improvements, etc., not only would result in reduced costs but would tend to increase his power consumption.

This customer was pleased with our cooperation. The study did not require elaborate tests—only a few calculations and the time of one engineer for a few days.

Utility Service Versus "Cheap" Diesel Power

The same customer received a proposal for the installation of a diesel plant. This will be discussed, instead of some other similar case because the previous analysis will tie in with this problem.

The proposal was for the installation of three 125-kw diesel engine driven generating units to cost about $35,000. This figure did not include such items as foundations, fuel oil storage, piping, wiring, etc. This selection of units was based on a recorded 30 minute maximum power demand of 243 kw, as given by the customer. The annual operating costs were given as follows:

Fuel oil, 49,000 gallons @ $0.06 per gallon	$2,940.00
Lubricating oil, 414 gallons @ $0.50 per gallon	207.00
Maintenance (estimated average)	400.00
Labor (part time)	300.00
Miscellaneous supplies	53.00
Insurance (estimated)	200.00
Total	$4,100.00

Inasmuch as the power bills averaged over $10,000.00 per year, first glance would indicate quite a saving. However, an analysis brought out the following:

The maximum billing demand had been 273 kw and not 243 (see Fig. 1). Also, loads shown by our demand indicators are average half-hour loads and are not a true indication of the peak load occurring during that period. The peak demand is always greater than the recorded billing demand; in fact it may be anywhere between a few per cent to several hundred per cent higher, depending upon the type of load.

Well-designed generating plants require sufficient capacity to serve peak loads with the largest unit out of service. The standby capacity necessary for supplying these peak loads is of considerable magnitude when compared to the load served.

Steam-driven equipment such as turbines and engines lend themselves to reasonable overloads. However, it is well known that, while diesel engines are rated with some overload allowance for short periods, it is poor engineering to count upon overload capacity to handle routine peaks. Overloading of diesel engines is recognized as being one of the main reasons for decreased life and increased fuel consumption and usually results in damage to equipment.

It will be recalled that the main drives in this plant are rubber mills and subject to very heavy load variations. These sometimes amounted to over 200 per cent of full load and often lasted for several minutes. This resulted in plant load peaks well over 300 kw so that the diesel engine installation as proposed would just about carry the load with all units running. Inasmuch as the factory's output was a seasonal product with no surplus stock kept on hand, a diesel unit out of service would result in a serious loss of business.

Extra heavy fly-wheels can be installed on diesel-generator units to provide for reasonable load swings. However, the load swings of this plant were of such magnitude and durations that even such fly-wheels on the units proposed would not be sufficiently effective.

Another factor that would effect the rating and therefore the cost of the electric generators was the power factor of the plant. The generators of Diesel engine units are usually rated on a kw capacity basis and a power factor of 80 per cent. The power factor of this plant varied between 60 per cent and 70 per cent and this would necessitate gener-

ators with a higher kilovolt-ampere rating than the ones proposed.

A plant to meet the load conditions of this factory should consist of three machines, two of which should be rated at 200 kw and one at 150 kw. This would provide 200 kw of standby. A plant of this size would cost about $79,750.00 complete and ready to run. This figure includes all items such as foundations, trucking, rigging, complete piping, cooling tower, common labor and superintendence during erection, switchboard, wiring, etc.

Also a few necessary additional items would have to be considered. These include interest on the investment, payroll tax and property taxes. Such a generating plant would present an entirely different picture. In other words, an adequate plant to supply this customer's load could not be had for anywhere near $35,000.00.

A comparison of costs between the present and the proposed methods of operation is shown in Table I. The fuel and lubricating requirements are based on the plant operating only while the factory is in operation. This would require a nominal service from the power company for night lighting, clocks, etc. If the plant were to be operated on a 24 hour basis, the incremental cost of fuel and oil would be greater than outlined.

It might be argued that the comparison as shown is definitely biased and the figures could be pared somewhat. For instance, the present boiler room labor might be able to take care of the diesel plant, although qualified labor is essential for a plant of this size. Any labor expended on the diesel plant must properly be charged to it. While the increased property tax might not apply in the immediate future, at least it must be considered.

Assuming that these items are omitted, the $3,300.00 differential between the plans would not only be wiped out but the figures would show a difference of $1,140.00 per year in favor of the diesel plant. However, this gain (if possible of realization) would require about 30 years to pay off the cost of the plant before a profit could be realized.

The investment figures were based on 5 per cent interest which is a nominal rate for an investment of this kind. For instance, if the amount required for installing this generating plant was invested for some other purpose, such as productive machinery or labor saving devices as suggested previously, the yield would undoubtedly be much higher than 5 per cent.

All estimates were based on a plant barely sufficient for immediate needs with little or no margin for expansion. Increased production would require additional generating facilities. Decreased production would result in a portion of the investment lying idle with no financial return.

The economic considerations were not the only ones this customer had to consider. There would be managerial problems. During the busy season particularly, the average factory operator has enough headaches without adding those of an electric light and power plant.

No reflection is intended on the firm who submitted this proposal. They stated specifically that it was tentative and would have to be thoroughly checked with actual requirements and fluctuating load conditions. Had they known as much as we did about this customer's utilization of electricity and his operating conditions, their findings would have undoubtedly been very much in line with ours.

TABLE I—SUMMARY OF ESTIMATED ANNUAL COSTS

	Present Method of Operation	*Proposed Method of Operation*
Investment		
2—200 kw and 1—150 kw Diesel engine generators completely installed with all fuel, water and exhaust piping, cooling tower, electrical work, etc.	.....	$79,750.00
Annual Operating Costs		
Interest at 5% on investment of $79,750.00	.....	$4,000.00
Fuel—56,000 gallons of Diesel oil at $.065 per gallon	.....	3,600.00
Lubricating Oil—700 gallons at $.60 per gallon	.....	420.00
Supplies and Repairs	.....	770.00
Labor (one man at $2,500.00 per year)	.....	2,500.00
Payroll Taxes (6.6% of $2,500.00)	.....	165.00
Property Tax (2.94% of assessed valuation on cost of Diesel plant)	.....	1,870.00
Liability Insurance	.....	600.00
Electric Energy—Nominal service of 10 kw and 500 kwhr per month during periods plant is not operating	.....	600.00
Electric Energy—521,200 kwhr and average monthly maximum demand of 214 kw	$11,204.94	.....
Total	$11,204.94	$14,525.00

Difference in favor of continuing with Utility Service—about $3,300.00 per year with no provision included for recovering the contemplated investment of $79,750.00.

Utility Service Versus An Existing Steam Plant

A complete analysis of the customer's method of operation is usually not attempted in cases of this kind. The analysis usually consists of allocating all of the live and exhaust steam uses, in other words, a heat balance is made. Factual data and estimates based on experience are used as much as possible. More elaborate tests and refined estimates are made when the customer is seriously interested. All plant operating costs such as fuel, labor, maintenance, etc., are also determined.

The operating cost is then compared with the cost of supplying all (or part) of the electrical requirements from Central Station service. The same operating conditions are used in both cases; that is, the proposed costs are determined by deducting from the existing costs all expense properly chargeable to electricity generation.

Existing steam electricity generating plants invariably owe their existence to the fact that the use of considerable exhaust steam is coincident with the electrical requirements. Assuming there is considerable diversity between the demands for steam and for electricity, the economy to be derived by shutting down the generating equipment is not always justified on this basis alone. This is particularly true if considerable new money is required to take electric service from the utility.

Theoretically, the best chance of meeting this situation is to revise the method of making the analysis as outlined above. Instead of considering the existing operating conditions in both cases, it might be well to investigate the whole establishment. Possibly overall operating costs can be reduced by shutting down the steam plant and utilizing Central Station service with improved operating methods. Let us see how this theory worked out in the following case:

A certain cleaning and dyeing establishment had a steam power plant consisting of one 150 hp boiler supplying steam to a Uniflow engine driving a 75 kw 3-phase, 60 cycle, 220-volt gen-

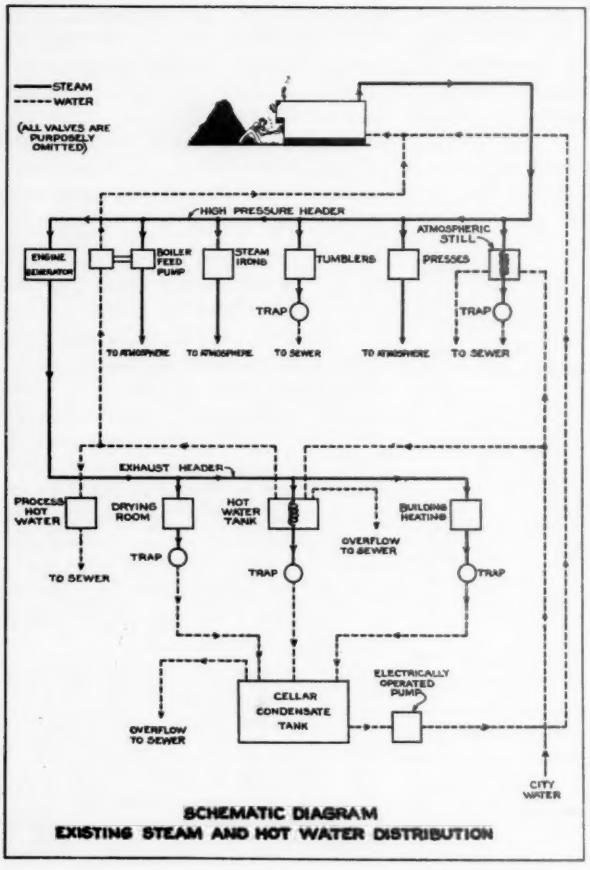


Fig. 2

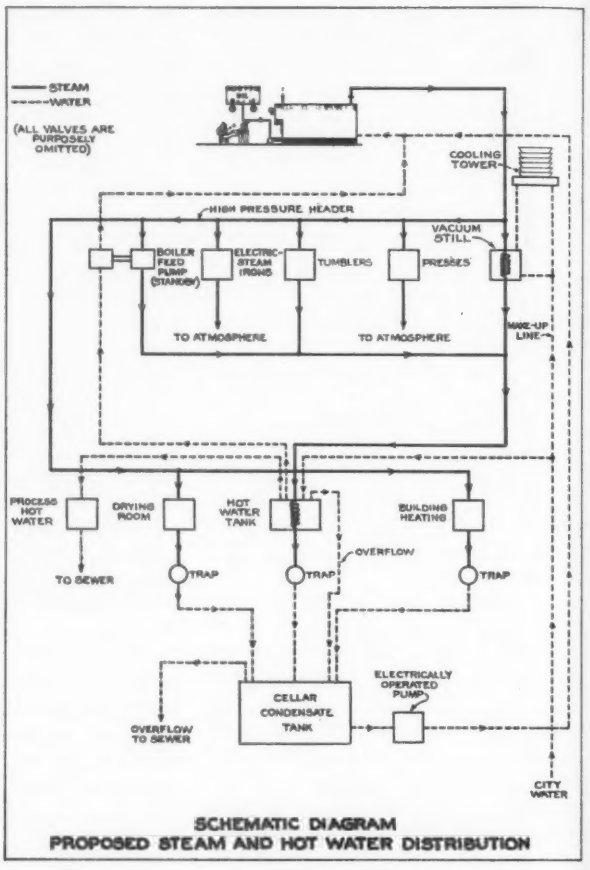


Fig. 3

erator. The exhaust steam from the engine was used for process, water heating and building heat during the winter. Live steam was also used for a cleaning fluid still, press machines, steam irons, tumblers, boiler feed pump, etc. The steam and hot water use and the disposition of condensate are shown in Fig. 2.

A "breakdown" service from the power company was used in case of emergency and to supply lighting and a small amount of power when the engine-generator was shut down. It would be very desirable to get this customer's entire load because adequate service facilities were already installed. The only new investment of the power company on the premises would be that of setting a new meter.

The customer was antagonistic toward the power company, having had some grievance several years ago. Permission to make a comparative cost study had been denied since the engine was installed. He finally consented after repeated efforts but was very skeptical about utility service being more economical than his method of operation.

Cost of operation was determined in the usual manner. This was compared with the cost of operation under the same conditions but with the engine shut down and all electrical requirements supplied from Central Station service. Inasmuch as practically all of the exhaust steam was used for the drying room, hot water heating and building heat, the customer was correct; that is, the result appeared to be negative as far as the utility was concerned.

Relations between the utility company and the customer had improved during the progress of the investigation. The engineer had learned enough from observation and deduction to conclude that if certain improvements were made in equipment and operating methods, overall costs could be reduced considerably. Perhaps the methods used for other types of problems could also be applied to this class of customer.

The case was accordingly reopened at the instigation of the writer and a different method of attack was used. All of the factory operations were investigated and this was augmented by occasional chats with the plant engineer. The following facts were brought to light as a result of all this:

1. The plant engineer had been afraid of losing his job and didn't tell everything he knew about the plant.
2. The electrically driven condensate pump did not pump the condensate from the cellar tank to the boiler because it was too small for the head and boiler pressure it encountered. It was kept running in the hope that some water might get back to the boiler somehow.
3. The cleaning fluid still was an atmospheric type and its condensate as well as cooling water flowed to the sewer.
4. The amount of hot water requirements had been incorrectly stated.
5. The drying room, operating only when the engine was running, did so mainly because exhaust steam was available. It was unused for long periods with the windows open to permit the heat to escape.

There were other details but the above are sufficient to show how uneconomically this establishment was operating.

A new method of operation was suggested and this included the following:

1. Shut down the steam engine and use Central Station service for all electrical requirements.
2. Use the drying room (supplied by live steam) only when required.
3. Purchase a more efficient type cleaning fluid still.
4. Install a cooling tower and reclaim the cooling water from the still.

5. Install a larger condensate tank in the basement and return all condensate back to the boiler.
6. Revise some of the existing piping connections.
7. Install oil burners and burn "bunker C" oil.
8. Replace the steam irons with electric (steam spray type).

A cost comparison between this method of operation and the then existing method showed an annual saving running into four figures. It was sufficient to write off the capital investment required in less than two years even though the electric bills would be three times what they were with breakdown service.

This remarkable difference was due of course, to the fact that so much heat was being wasted by the exhaust steam and the condensate. The customer didn't need nearly as much as he thought he did. The use of live steam could also be greatly reduced by improved operation. These improvements were dependent more or less on engine operation being discontinued.

The changes suggested are shown in Fig. 3. These are now being made, a new contract has been signed and the engine is shut down.

Summary

The cases cited serve to bring out the principles mentioned in the opening paragraphs of this paper. They are not typical because no two problems of a similar nature are exactly alike. Some investigations of existing customer's electric utilization are barren of results and some show only mediocre possibilities. These are in the minority, however, and most investigations show some possibility of reducing operating costs.

Obviously, all studies involving the customer's operations must be for the customer's and the power company's mutual advantage. Negative results will mean no change in status and no expense to the customer. The power company, on the other hand, will at least know where it stands and can better evaluate the cost and degree of future sales effort. A reduction of the customer's overall operating costs may well result from such an investigation and the power company may gain additional load.

The routine methods required to effectively apply the principles cited in this paper will depend of course, upon the power company's organization structure and the ideas of its management. Close cooperation between the sales forces and the engineers is necessary and good judgment is required in all cases. Also, as many facts as possible, should be gathered even though they may appear unrelated. This will facilitate deciding the most efficient course to follow in making an investigation.

For instance, a customer may have a great deal of non-electrically driven equipment, all operating inefficiently.

A power salesman in the course of his routine duty, may request an engineer to make an operating cost study, comparing such operation with electrically operated equipment. The engineer in turn may proceed to survey the premises and order an expensive installation of test equipment. After sufficient data has been obtained, elaborate calculations and cost estimates of new equipment might be made. All of this would be summarized in a report which would be forwarded to the salesman as the answer to the problem.

This would be of little value if further investigation on the part of either the salesman or the engineer would have disclosed that the customer was contemplating the installation of modern equipment, with different operating conditions, at a new location. Or, as happened in one case, they are in poor financial condition and any new money that might be available at some future time would first have to be used for removing sanitary and other building code violations.

The proper procedure in such cases is to make as accurate estimates as possible from factual data based on experience. These can be presented to the customer along with sales effort, pointing out the advantages to be derived by making the suggested improvements. More accurate and detailed determinations can be made when and if the picture improves and the customer has been sold to the point where he is seriously interested.

Conclusion

It would appear from all the foregoing that in order to meet present day competition, complete knowledge must be had of a customer's utilization and processes. Close cooperation must exist between the customer, the salesman and the engineer in order to do this efficiently. Hurried and superficial studies may result in pertinent facts being overlooked. The salesman and the engineer must keep each other informed of all phases concerning a particular problem and they in turn, must be guided by competent and understanding supervision.

The type of engineering involved requires intimate knowledge of competing forms of power production and a broad knowledge of industrial and manufacturing processes. The engineer must not only be able to analyze the technical features of proposals by competitors but must also know whether or not they will be suited to the customer's purpose.

Such proposals are often fostered by outside consultants and it is not sufficient for the utility engineer to have an equal general knowledge and experience. He must make it his business to know more about the customer's electrical utilization and operations than anybody else. Only in this way can he hope to acquire the necessary prestige for his company to put all competitors definitely on the defensive.

Periodic lectures outlining company policy and routine methods to be followed by salesmen and engineers might be advisable. These should preferably be made to small groups to more easily invite open discussion. Such lectures and discussions would make for complete understanding of each others problems and would aid in achieving the results desired by the company.

Water Heating Sales Promotion

(*Continued from page* 446)

to other parts of the system in the near future.

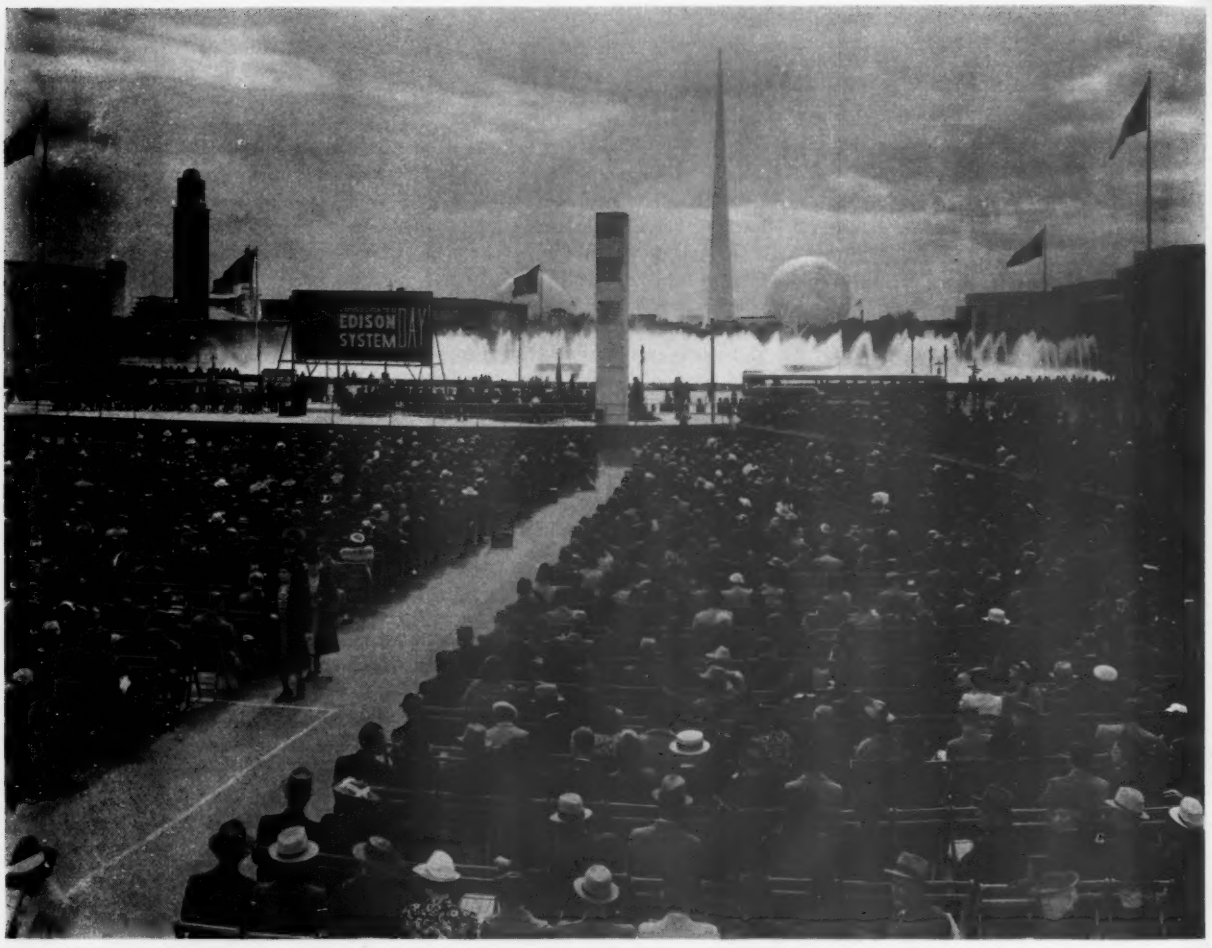
Working along these lines the company has been able to obtain a water heating saturation of 23 per cent with an electric cooking saturation of 53 per cent. Domestic customers used an average of 1719 kwhr in 1938.

The following tabulation gives sales results for the past six years:

	Company	*Dealer*	*Total*
1933	356	0	356
1934	419	0	419
1935	1,319	0	1,319
1936	2,223	295	2,518
1937	1,756	532	2,288
1938	1,485	618	2,103

A number of the small non-pressure type of heaters have been sold in small commercial establishments, service stations, etc. A campaign is now being launched to promote the use of this type in commercial establishments. Total sales of non-pressure heaters is estimated at 300 units for 1939.

A combination of intensive campaigns, continuous sales training, effective dealer coordination, advertising and rates of a nature competitive with other fuels has been the main factor in obtaining the results which have been made to date.



Fifty Thousand Employees and Relatives Celebrate Consolidated Edison Day at N. Y. World's Fair

CONSOLIDATED Edison System Day, Sept. 11, at the New York World's Fair 1939 drew to the Fair 50,000 Consolidated Edison System workers, friends and family members, including 20,000 employees. Ceremonies included a Court of Peace meeting at which Floyd L. Carlisle, chairman of the board, was the principal speaker; a get-together for 2500 supervisory group members and a hookup of the "City of Light" exhibit with the historic Edison "Jumbo" dynamo displayed at the Ford Exposition.

Headed by Mr. Carlisle, Oscar H. Fogg, vice-chairman, and Ralph H. Tapscott, president, the day's official group included Consolidated Edison officers and trustees, representatives of the Edison family, and 40 pioneer associates of Thomas A. Edison.

"Furnishing Electricity to the New York World's Fair 1939" was the subject of Mr. Tapscott's address before the 2500 supervisory group employees in the Hall of Music, Mr. Fogg presiding. Mr. Tapscott said that the Consolidated Edison electric load in New York City and Westchester is expected to reach 2,000,000 kw in 1942, 60 years after the opening of New York City's pioneer Pearl Street Station. A tabloid version of Consolidated Edison's "Echoes of New York" 1939-1940 radio program was presented by Helen Jepson of the Metropolitan Opera Company, Helen Claire, Joseph Bonime's orchestra, the Edisoneers, George B. Hicks, master of ceremonies, and others. Additional music was furnished by the 48-piece Brooklyn Edison Band.

A climax to the program was furnished at the Ford Exposition's Edison Institute exhibit at 8:40 p.m., when Mr. Carlisle threw a switch interconnecting the "Jumbo" dynamo with the Consolidated Edison building. Edison pioneers and other members of the official group participated in the ceremony. By means of a special hookup, energy generated by the veteran machine, the world's first commercial incandescent lighting service dynamo, was transmitted across the Fair grounds to the Consolidated Edison exhibit, where it actuated mechanism lighting the "water ballet" spectacle outside the building, as well as the "City of Light" diorama.

Around the hookup was built the public utility industry's first television program, broadcast over Station W2XBS between 8 and 9 p.m. Produced by the National Broadcasting Company, in collaboration with the Consolidated Edison Company, the program recorded or reproduced action at three separate points.

Rewiring at Less Cost

Reprinted from *Buildings and Building Management*, September, 1939

PRESENT efforts to liberalize the national electrical code to permit the use of new and less expensive methods of wiring are of vital interest to building owners and managers. As building operators, they are directly concerned in this campaign to reduce wiring costs, for it is reliably estimated that at least 75 per cent of all buildings erected prior to 1930 are now inadequately wired, and it is common knowledge in the industry that the high cost of rewiring is one of the major problems in modernizing office and apartment buildings.

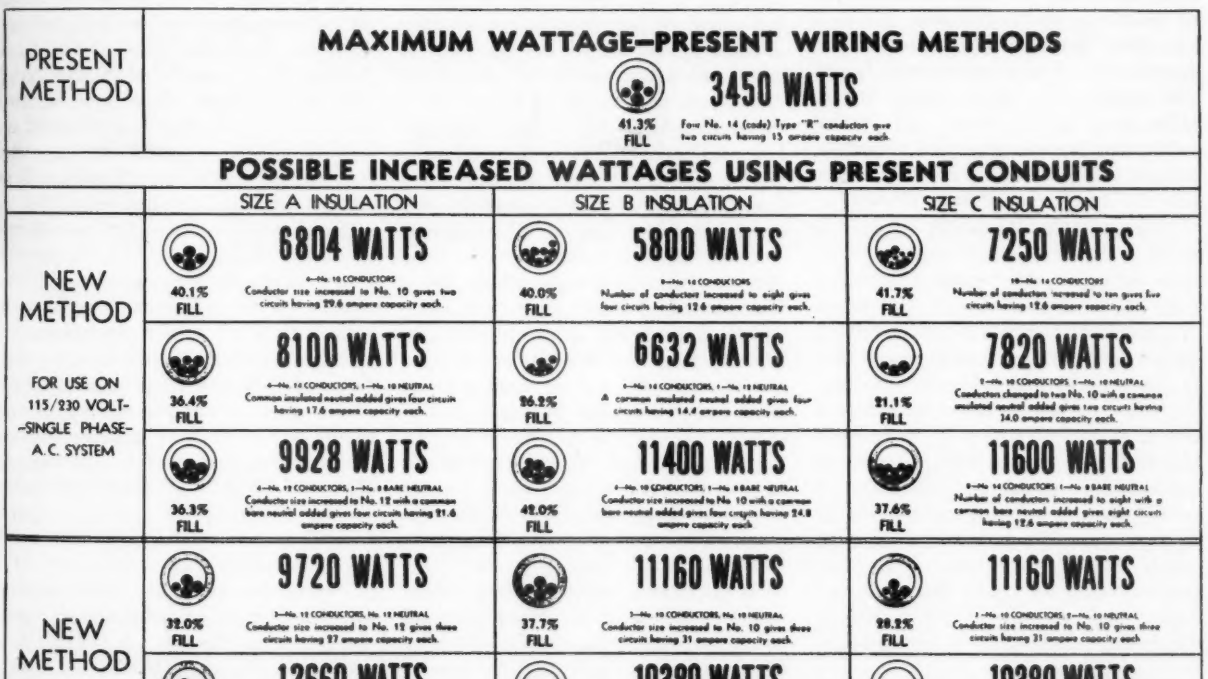
If wiring costs can be substantially reduced, it is quite possible that building owners and managers will be able to go ahead with many modernization jobs which have until now been deferred because of prohibitive rewiring expense.

"Building owners and managers have a direct interest in present efforts to liberalize the national electrical code to permit the use of new and less expensive methods of wiring. If the methods here described are approved by the code and are as effective as the engineers expect them to be, the task of rewiring office and apartment buildings will be greatly simplified."

Until fairly recently, it has been generally agreed that this expense was unavoidable because of requirements set up by the national electrical code. This code, which is primarily concerned with the safety of electrical installations, is the product of conferences and committee meetings of virtually all groups interested in the manufacture, installation and inspection of electrical equipment. It serves as a model for local electrical codes in individual cities, and is commonly accepted as the final authority on electrical installations.

This code, of course, must be revised and modified from time to time to keep pace with technical developments in manufacture and with improvements in installation technique. The present code is to come up for revision this fall.

There are many who believe that its provisions should be modified at that


PRESENT METHOD
MAXIMUM WATTAGE—PRESENT WIRING METHODS
41.3% FILL
3450 WATTS
Four No. 14 (code) Type "R" conductors give two circuits having 15 ampere capacity each
POSSIBLE INCREASED WATTAGES USING PRESENT CONDUITS
SIZE A INSULATION
SIZE B INSULATION
SIZE C INSULATION
NEW METHOD
FOR USE ON 115/230 VOLT--SINGLE PHASE-A.C. SYSTEM
40.1% FILL
6804 WATTS
6—No. 14 CONDUCTORS
Conductor size increased to No. 10 gives two circuits having 29.6 ampere capacity each.
40.0% FILL
5800 WATTS
6—No. 14 CONDUCTORS
Number of conductors increased to eight gives four circuits having 12.6 ampere capacity each.
41.7% FILL
7250 WATTS
10—No. 14 CONDUCTORS
Number of conductors increased to ten gives five circuits having 12.6 ampere capacity each.
36.4% FILL
8100 WATTS
4—No. 14 CONDUCTORS, 1—No. 10 NEUTRAL
Common insulated neutral added gives four circuits having 17.6 ampere capacity each.
36.2% FILL
6632 WATTS
4—No. 14 CONDUCTORS, 1—No. 12 NEUTRAL
A common insulated neutral added gives four circuits having 14.4 ampere capacity each.
21.1% FILL
7820 WATTS
8—No. 10 CONDUCTORS, 1—No. 10 NEUTRAL
Conductors changed to two No. 10 with a common insulated neutral added gives two circuits having 34.0 ampere capacity each.
36.3% FILL
9928 WATTS
6—No. 12 CONDUCTORS, 1—No. 8 BARE NEUTRAL
Conductor size increased to No. 12 with a common bare neutral added gives four circuits having 21.6 ampere capacity each.
42.0% FILL
11400 WATTS
6—No. 10 CONDUCTORS, 1—No. 8 BARE NEUTRAL
Conductor size increased to No. 10 with a common bare neutral added gives four circuits having 24.8 ampere capacity each.
37.6% FILL
11600 WATTS
8—No. 14 CONDUCTORS 1—No. 8 BARE NEUTRAL
Number of conductors increased to eight with a common bare neutral added gives eight circuits having 12.6 ampere capacity each.
NEW METHOD
FOR USE ON 120/208 VOLT--3PHASE 4 WIRE SYSTEM
32.0% FILL
9720 WATTS
3—No. 10 CONDUCTORS, No. 10 NEUTRAL
Conductor size increased to No. 12 gives three circuits having 27 ampere capacity each.
37.7% FILL
11160 WATTS
3—No. 10 CONDUCTORS, No. 10 NEUTRAL
Conductor size increased to No. 10 gives three circuits having 31 ampere capacity each.
28.2% FILL
11160 WATTS
3—No. 10 CONDUCTORS, 0—No. 10 NEUTRAL
Conductor size increased to No. 10 gives three circuits having 31 ampere capacity each
45.9% FILL
12660 WATTS
6—No. 14 CONDUCTORS, 1—No. 10 NEUTRAL
Conductor size increased to No. 12 with common insulated neutral added gives four circuits having 21.6 ampere capacity each.
36.3% FILL
10380 WATTS
6—No. 14 CONDUCTORS, No. 12 NEUTRAL
Number of conductors increased to six with a common neutral added gives six circuits having 14.4 ampere capacity each.
30.4% FILL
10380 WATTS
6—No. 14 CONDUCTORS 1—No. 10 NEUTRAL
Number of conductors increased to six and size to No. 12 with a common insulated neutral added gives six circuits having 14.4 ampere capacity each
34.4% FILL
13320 WATTS
3—No. 10 CONDUCTORS, 1—No. 8 BARE NEUTRAL
Conductor size increased to No. 10 with the common bare neutral gives three circuits having 37 ampere capacity each.
42.0% FILL
13260 WATTS
6—No. 12 CONDUCTORS, 1—No. 8 BARE NEUTRAL
Number of conductors increased to six and size to No. 12 with a common bare neutral added gives six circuits having 18.4 ampere capacity each
36.4% FILL
13260 WATTS
6—No. 12 CONDUCTORS No. 8 NEUTRAL
Number of conductors increased to six and size to No. 12 with a common bare neutral added gives six circuits having 18.4 ampere capacity each.

This chart shows in detail the various wattages that can be carried in a one-half inch conduit under present approved methods and under the proposed new methods. The new possibilities of gaining increased wattages without replacing existing conduit are self-evident. If the new methods are approved in the revision of the national electrical code, it is thought that revision of local codes will follow shortly

time to permit the use of new methods and new materials which would greatly reduce wiring costs. These include:

(1) A new type of insulated conductor which, the engineers say, will provide greater safety with a material reduction in the thickness of the insulating covering. Technical data now available indicate that the amount of capacity in existing conduits can be increased two, three or even four times with greater than present safety and without the necessity of having to dig out concealed conduits, replace them, and then patch, plaster and redecorate. Under the present code requirements, any increase in conductors means an increase in conduit size. The thin-wall conductors will, when approved, make it possible to pull wires of greater capacity through the existing conduits.

(2) Bare-neutral wiring in well-grounded alternating current systems. Codes generally require that grounded wires in distribution systems of the alternating current type have the same type of insulation as "hot" wires, but field experience in thousands of installations demonstrates that a bare-neutral is safe and satisfactory. Bare-neutral wiring offers many important savings. It increases the copper capacity of a conduit, is more easily installed, and makes possible the installation of more circuits.

(3) Increasing the wiring capacity of conduits by permitting them to carry more wiring. The national electrical code has heretofore limited the fill or occupancy of interior area of conduits to 40 per cent. Experience in many parts of the country proves conclusively that the safety of an installation (which is one of the primary aims of the national electrical code) is not jeopardized when conduit fills as much as 50 per cent are permitted. This change alone permits 25 per cent additional wiring capacity, and is especially important when considered in conjunction with thin-wall conductors and bare-neutral wiring, both of which serve to decrease the area required for a given capacity.

The possibilities of these three developments in reducing wiring costs are so promising that there is steadily increasing demand for code revisions to permit them. The theory, of course, is that if the national electrical code is revised and modified to allow the use of the new materials and new methods, it will be only a matter of time until their use is permitted under revisions of local codes.

Meanwhile, even before the codes are actually revised, it may be possible for building owners and managers to get special authorization from local licensing and inspection officials to use these methods and materials on specific rewiring jobs. It is reported that large buildings are already being rewired under special permission in some cities, and there is reason to think that similar concessions can be obtained in other cities if building owners and managers will take the time to study the new methods and materials, and will actively urge local officials to permit their use.

Referring to these new wiring methods in the July issue of *Buildings and Building Management,* William E. Malm urged that the office building industry "be permitted to utilize the products of new industrial developments to correct many of the inadequacies of building operation without being hampered by restrictive code requirements which have outlived their usefulness. The increasing demand for greater electric loads has been apparent for a long period and we have been fully conscious of the lack of capacity in our electrical distribution systems to meet the demand. Our failure to provide proper wire capacity has been a question of cost. Simplify local and national codes and the office building industry will make further contribution with respect to re-employment and at the same time enjoy the benefits which result from lower operating and maintenance costs."

Rocky Mountain Electrical League Convention

MORE than 220 electrical men and women of the Rocky Mountain Electrical League journeyed this month to Estes Park, Colorado, to celebrate the sixtieth anniversary of the incandescent lamp and to participate in the three-day annual meeting, Sept. 7-9, of its so-called Kee-Lo-Watt Tribe, with the League President, W. N. Clark, Southern Colorado Power, presiding.

A. W. Conover, vice-president and general manager Central Ohio Light & Power, emphasized that a public relations program cannot be set up like a construction budget. He said that "when dealing with newly created governmental agencies we have tried to acquaint them with our problem, and we have found them exceptionally cooperative." Through nine years of experiment, he declared, his system has discovered that the best policies have come from the organization up to the management, rather than from the management down.

At the closing banquet, Mr. Conover was presented with the league's annual award for outstanding service to the industry.

C. W. Leihy, editor of *Electric Light & Power,* suggested that systems interpret their taxes, rates—all statistics related to public relations—in terms of their meaning to one, individual employee, rather than to the system as a unit.

Participating from outside league territory were L. A. S. Wood, Westinghouse's chief lighting engineer: A. F. Dickerson, General Electric's lighting sales manager; A. E. Schanuel, Adequate Wiring Bureau; W. H. Hanna, Modern Kitchen Bureau.

At the Edison dinner Herbert S. Sands, Denver consulting engineer and one-time Edison worker, was introduced by L. R. Storey, convention chairman. Mr. Sands sketched a picture of the love of work and scorn of fatigue which measured the famous inventor's success. He suggested that the industry's future honors will go to men operating on those principles.

Speaker at the convention banquet was Karl E. Mundt, U. S. Congressman, South Dakota, who spoke on "The America I Want." America at war, he said, will be the end of democracy. If America stays at peace, democracy may be saved. To save it, he said, the people must act to return the balance of economic power to local groups, whether private, municipal or state. He argued that once Uncle Sam becomes established as our biggest banker and our biggest business man there will be but one check upon him—revolution.

Elected president for next year was H. E. Samson, Southwestern Public Service Co., Roswell, N. M.; vice-presidents, M. C. Heffelman, Deming Ice & Electric Co.; E. E. Brazier, G.E. Supply, Denver, and J. W. Alexander, Rawlis Electric Co., Wyoming.

Redrafted for active duty, this time as a vice-president, was Gaylord Buck, vice-president and commercial manager of Public Service Company of Colorado.

In summing up the public relations discussions, emphasizing the importance of men down the line, Mr. Buck delivered the meeting's tersest sentence: "Sergeants won the first World War."

Pennsylvania Electric Association Convention

A RECORD attendance and a timely program at the 32nd Annual Convention of the Pennsylvania Electric Association, held at Bedford Springs Sept. 6-8, amply sustained the fine reputation of this organization for its annual meeting.

Reviewing his administration year, President W. H. Swinney cautioned utility executives that "neither hazy thinking nor wishful hoping are in order today." He warned them that they must guard against a tendency to live in the past.

Pointing out that ten years ago executives gave practically all their time to maintenance and operations of plants, Mr. Swinney said that today these functions are delegated to assistants or subordinates, while the executives attempt to deal with the exacting demands of new laws, new rules and new regulations which, in the old days, had never been heard of. He said that this is not a healthy condition. "Unless we can inject into our viewpoint the spirit of youth, the adaptability to change and an attitude of clear, hard thinking, it will be rough going."

Dr. William Trufant Foster, Boston economist, said that all signs point to better business conditions in the immediate future. The ability to produce and the demand for products merely await confidence to expand the vast stores of bank credits and create a major upsurge in business, he asserted.

Dr. Foster said that incentive is coming back and, with the return of confidence, business would get better. He pointed out that the utilities constitute the only industry which has increased its production above the 1929 level. He said that it now stands about 40 per cent above ten years ago.

At the close of the convention the association went on record to support the War Resources Board and other state and national agencies in time of national crisis. It stood ready to assure adequate power supplies to meet emergency demands.

Richard P. Brown, Secretary of Commerce of Pennsylvania, offered the utilities the full cooperation of his new department to aid the industry in every proper manner, whenever opportunity offers. He said that one way in which the utilities could aid industrial growth in Pennsylvania was for industrial power salesmen to work closely with the new department.

BERNARD P. CAREY
Newly elected president of Pennsylvania Electric Association

E. C. Stone, vice-president and general manager of Duquesne Light Company presented the responsibilities of the engineers. It appeared to him that many engineers confine themselves too much to the study and application of physical laws and to purely technical solution of their problems, without giving sufficient attention to the human or psychological forces that are operating around them.

He urged study of the desires and habits of the community and to consider the attitude of the public toward the work of the utilities.

To the young engineering graduate who is considering the electric utility as a field for life work, Mr. Stone said that he need not consider that his usefulness is confined to the planning, designing and building of power systems, for there are other phases of utility operations demanding engineering knowledge and skill in management.

Mr. Stone warned against what he termed "perhaps the greatest danger confronting our industry at the present time —the possibility of too much self-complacency."

A. G. Butler, Duquesne Light, declared that engineers are not satisfied as things are and are looking for new improvements and developments.

Charles A. Eaton of New Jersey told the convention that there is need to widen the horizon of thinking. He asked for a renewal of faith and the rediscovery of the essence of American life.

Prof. R. U. Blasingame, chief of the agricultural engineering department, Penn State College, expressed the belief that rural electrification will pay its way. "You scarcely have it now, for rural electrification is electricity at work to the fullest practical extent, and to the maximum economic advantage of the farmer," he said.

The major problem of the utilities and farmers is to bring about a more complete use to realize the full economic advantages from the enormous investments which they have jointly made in rural electrification, Professor Blasingame declared. He asserted that during the past twelve years the utilities have built 25,000 miles of line, costing about $49,000,000 and serving 85,000 farmers, in addition to a large number of other rural customers. These lines pass the front doors of 20,000 other farmers who have not availed themselves of this service, he said. "I estimate that these 85,000 farmers have invested $50,000,000 for wiring and electrical equipment."

H. L. Mitchell, president of West Penn Power Co., said that there are boundless opportunities to create jobs and to make money and the electrical industry can assist greatly in bringing this about. He warned against the "loss of heart" in the outlook and the seclusion of security.

Bronze plaques were presented to Metropolitan Edison and Edison Light & Power as winners in groups A and B, respectively, in the annual safety contest. Edison Light & Power for the second consecutive year repeated its "no-accident" record. Runners up in Group A were Pennsylvania Power & Light and Philadelphia Electric. Keystone Public Service and Home Electric Light & Steam Heating Co. also had "no-accident" records in Group B, but did not show as many exposure hours as the Edison company.

Bernard P. Carey, counsel of Philadelphia Electric Co., was elected president of the association to succeed Mr. Swinney. Vice-president selected included Edmund C. Stone, Duquesne Light; M. H. Parkinson, Pennsylvania Power & Light, and Louis B. Round, Pennsylvania Power.

Elected to the executive committee were A. J. Althouse, Metropolitan Edison; H. B. Bryans, Philadelphia Electric; N. G. Reinecker, Pennsylvania Power & Light; Walter C. Sontum, Pennsylvania Edison, and A. L. Hallstrom, Graybar Electric.

Basic Elements

(*Continued from page* 454)

doubts. Checking actual yearly consumption against estimates prepared from six months' actual consumption prorated on a yearly basis by means of an average consumption curve, indicates an error of from 5 to 8 per cent in estimates as compared with actualities. This error seems small enough to warrant studies being made on a six months' basis. We also feel justified in eliminating from such studies those customers who show decreases. Accumulated experience shows that as far as we can determine, there is nothing in a home lighting activity that leads to decreases. A multitude of social, business and personal reasons seem to account for such action, and it does not seem fair to debit a sales department for something which is certainly out of its control. Such knowledge, however, can well be put to account in preparing prognostications of the overall effect of any sales program, because the closer we can bring realized benefits to those anticipated in a prospectus, the greater the respect that can be commanded for all promotional plans.

Whenever it is difficult to lay hands on tangibles, we all try to justify actions or programs on the basis of intangibles. But having demonstrated what seems to me to be some respectable tangibles, I feel no need for defense in bringing up a well known intangible—good will. Many executives in utility companies have expressed to me the belief that the work of a home lighting advisor is of inestimable value in bringing our customers into closer touch with an incomprehensible product, and an often little understood industry. Here is a girl with a friendly smile who takes time to show a homemaker how our product can make her home more beautiful, protect valuable eyesight and add to the comfort and convenience of her family. The advisor develops a program that appeals to every woman's shopping instincts; a program that is tailored to her needs and her pocketbook. It is truly advisory and cooperative—there need be none of the pressure and hurry of competitive selling.

Interwoven among the threads of the lighting story there is usually a number of non-related details ranging from past experiences with the company, appliance advice, minor repair suggestions, to personal anecdotes, clothes and neighborhood gossip. It is almost a certainty that when a good interview is over, the utility appears much more human and understandable, an impression that cannot help but pay dividends in one form or another.

So I repeat what has been said before. Home lighting is profitable when measured by accepted standards, but beyond that brings returns in good will which may prove to be worth as much as the capital invested in business.

In concluding this summary of four years' experience with home lighting, I realize that only the highlights have been touched. It is hoped that this recount will be of benefit as an addition to the growing fund of knowledge concerning home lighting promotion, by means of which we can build stronger and more productive organizations to carry on this unusually interesting and worthwhile job of fitting light to living.

CONVENTIONS AND MEETINGS

SEPTEMBER

6-8 Pennsylvania Electric Association, Bedford Springs Hotel, Bedford Springs, Pa.
7-9 Rocky Mountain Electric League, Estes Park, Colo.
20 General Sales Committee, EEI Headquarters, New York, N. Y.
21-22 Rural Sales Conference, Hay Loft, Electrified Farm, World's Fair, N. Y.
21-22 Wisconsin Utilities Association, Accounting Section, Plankington Hotel, Milwaukee, Wis.
28-30 Indiana Electric Association, French Lick Springs, Ind.

OCTOBER

2-3 Prime Movers Committee, EEI, 420 Lexington Avenue, New York, N. Y.
2-6 National Restaurant Association, Chicago, Ill.
4 International Association of Electrical Leagues, Grand Central Palace, New York, N. Y.
5 Third Annual Conference, Commercial Electric Cooking Council, Chicago, Ill.
5-6 Illinois Public Utilities Association, Knights of Columbus Building, Springfield, Ohio.
6-7 Public Utilities Association of West Virginia, The Greenbrier Hotel, White Sulphur Springs, W. Va.
8-10 Controllers Institute of America, New York, N. Y.
9-10 Electrical Equipment Committee, E. E. I., New Ocean House, Swampscott, Mass.
9-12 American Gas Association, New York City, N. Y.
9-12 National Electrical Contractors Association, Bellevue-Stratford Hotel, Philadelphia, Pa.
10-11 Transmission and Distribution Committee, EEI, New Ocean House, Swampscott, Mass.
13-14 Accident Prevention Committee, EEI Headquarters, 420 Lexington Ave., New York, N. Y.
16-20 National Safety Council, Atlantic City, N. J.
19-20 Empire State Gas and Electric Association, Westchester Country Club, Westchester, N. Y.
23-27 National Electrical Manufacturers Association, Palmer House, Chicago, Ill.

NOVEMBER

6-7 Wisconsin Utilities Association, Electric, Commercial and Technical Divisions, Schroeder Hotel, Milwaukee, Wis.
13-15 Third National Accounting Conference, Edgewater Beach Hotel, Chicago, Ill.

DECEMBER

4-5 Prime Movers Committee, EEI, Philadelphia, Pa.
4-9 American Society of Mechanical Engineers, Philadelphia, Pa.

FEBRUARY

5-6 Prime Movers Committee, EEI, Detroit, Mich.

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